University of Madras

THE

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VOL. I

PART II

Syllabuses and Text books.

UNIVERSITY OF MADRAS

THE CALENDAR FOR 1931-32

VOL. I

PART II

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APPENDIX I.

MATRICULATION EXAMINATION

(a) SYLLABUS

Detailed Syllabus in Theoretical Geometry

Angles at a point.—If a straight line stand on another straight line, the sum of the two angles so formed is equal to two right angles and the converse.

If two straight lines intersect, the vertically opposite angles are equal.

Parallel straight lines.—When a straight line cuts two other straight lines, if

(i) a pair of alternate angles are equal, or

(ii) a pair of corresponding angles are equal, or

(iii) a pair of interior angles on the same side of the cutting line are together equal to two right angles, then the two straight lines are parallel; and the converse.

Straight lines which are parallel to the same straight line are parallel to one another.

Triangles and rectilinear figures.—The sum of the angles of a triangle is equal to two right angles.

If the sides of a convex polygon are produced in order, the sum of the angles so formed is equal to four right angles.

If two triangles have two sides of the one equal to two sides of the other, each to each, and also the angles contained by those sides equal, the triangles are congruent.

If two triangles have two angles of the one equal to two angles of the other, each to each, and also one side of the one equal to the corresponding side of the other, the triangles are congruent.

If two sides of a triangle are equal, the angles opposite to these sides are equal; and the converse.

If two triangles have the three sides of the one equal to the three sides of the other, each to each, the triangles are congruent.

If two right-angled triangles have their hypotenuses equal, and one side of the one equal to one side of the other, the triangles are congruent.

If two sides of a triangle are unequal, the greater side has the greater angle opposite to it; and the converse.

Of all the straight lines that can be drawn to a given straight line from a given point outside it, the perpendicular is the shortest.

The opposite sides and angles of a parallelogram are equal each diagonal bisects the parallelogram, and the diagonals bisect one another.

If there are three or more parallel straight lines, and the intercepts made by them on any straight line that cuts them are equal, then the intercepts made by them on any other straight line that cuts them are also equal.

Areas.—Parallelograms of the same altitude on the same or equal bases are equal in area.

Triangles of the same altitude on the same or equal bases are equal in area.

Equal triangles on the same or equal bases are of the same altitude.

Illustrations and explanations of the geometrical theorems corresponding to the following algebraical identities:—

$$k(a+b+c+\ldots)=ka+kb+kc+\ldots,$$
$$(a+b)^2=a^2+2ab+b^2,$$
$$(a-b)^2=a^2-2ab+b^2,$$
$$a^2-b^2=(a+b)(a-b),$$
$$(a+b)^2-(a-b)^2=4ab,$$
$$(a+b)^2+(a-b)^2=2a^2+2b^2.$$

The square on a side of a triangle is greater than, equal to, or less than the sum of the squares on the other two sides, according as the angle contained by those sides is obtuse, right or acute. The difference in the cases of inequality is twice the rectangle contained by one of the two sides and the projection on it of the other.

Loci.—The locus of a point which is equidistant from two fixed points is the perpendicular bisector of the straight line joining the two fixed points.

The locus of a point which is equidistant from two intersecting straight lines consists of the pair of straight lines which bisect the angles between the two given lines.

The locus of the vertices of all triangles which have the same base and the sum of the squares of their sides equal to a given square is a circle having its centre at the middle point of the base.

The locus of the vertices of all the triangles which have the same base and the difference of the squares of their sides equal to a given square is a straight line perpendicular to the base.

The locus of the vertices of all the triangles which have the same base and their vertical angles equal to a given angle is the arc of a segment of a circle.

The Circle—A straight line drawn from the centre of a circle to bisect a chord which is not a diameter, is at right angles to the chord; conversely, the perpendicular to a chord from the centre bisects the chord.

There is one circle and one only, which passes through three given points not in a straight line.

In equal circles (or, in the same circle) (i) if two arcs subtend equal angles at the centres, they are equal; (ii) conversely, if two arcs are equal, they subtend equal angles at the centres.

In equal circles (or, in the same circle) (i) if two chords are equal, they cut off equal arcs; (ii) conversely. if two arcs are equal, the chords of the arcs are equal.

Equal chords of a circle are equidistant from the centre; and the converse.

The tangent at any point of a circle and the radius through the point are perpendicular to one another.

If two circles touch, the point of contact lies on the straight line through the centres.

The angle which an arc of a circle subtends at the centre is double that which it subtends at any point on the remaining part of the circumference.

Angles in the same segment of a circle are equal; and if the line joining two points subtends equal angles at two other points on the same side of it, the four points lie on a circle.

The angle in a semi-circle is a right angle; the angle in a segment greater than a semi-circle is less than a right angle; and the angle in a segment less than a semi-circle is greater than a right angle.

The opposite angles of any quadrilateral inscribed in a circle are supplementary; and the converse.

If a straight line touch a circle, and from the point of contact a chord be drawn the angles which the chord makes with the tangent are equal to the angles in the alternate segments.

If two chords of a circle intersect either inside or outside the circle, the rectangle contained by the parts of the one is equal to the rectangle contained by the parts of the other; and the converse.

Elementary Science (1) Physics, (2) Chemistry

The examination shall test whether the subjects included in the following syllabus have been taught by the aid of experimental demonstrations—wherever this is possible. The application of physical and chemical facts and principles to experience in ordinary life should receive particular attention.

It is desirable that, as far as the accommodation and equipment of the school will allow, pupils receive practical instruction in the physical and chemical processes included in the syllabus.

1. *Physics.*—Measurement of length. Meaning of a unit and the measurement of a physical quantity. British and metric units; their multiples and sub-multiples. Derived units of area and volume. Measurement of area and volume.

Measurement of time. Unit of time. Rotation of the earth. Measurement by simple pendulum.

Speed: its measurement involving length and time; calculation of speed in given cases. Elementary ideas regarding acceleration. Illustration of First Law of Motion; definition of force.

Matter: definitions. Measurement of mass. British and metric unit; determination of mass by spring balance, and by ordinary balance. Density and specific gravity.

Gravitation. All matter attracted by the earth; illustration of Second Law of Motion: attraction is mutual: illustration of Third Law of Motion: Universality of gravitation. Weight of a body. Distinction between mass and weight.

Properties of matter. Extension, inertia, gravitation, divisibility, porosity, hardness, elasticity, transparency and opacity. Cohesion: ductility, malleability, brittleness: plasticity, viscosity. The three states of matter. Changes of state produced by heating and cooling. Permanent and temporary effects of heating different substances: effects on organic substances; tempering of metals.

Simple machines. The lever: its general principle and application to the common balance, and the wheel and axle. The pulley and the inclined plane: application of the screw.

Centre of gravity; definition. Experimental determination of centre of gravity in simple cases. Condition of equilibrium of a body resting in a given position; stable, unstable and neutral equilibrium. The common balance; how mass is measured by weighing.

Solids. permanence of shape and volume which are only altered by application of forces.

Liquids: no permanent shape. Surface of liquid at rest horizontal. Pressure defined. In fluids, it acts in all directions and is greater at greater depths. Transmission of pressure and its evaluation. Bramah Press. The principle of Archimedes; its experimental proof and applications.

Gases: how distinguished from liquids. Gases have weight. Balloons, Pressure of the atmosphere; the mercury barometer; variation of atmospheric pressure with height proved by mercury barometer; the water barometer. Evaluation of pressure of atmosphere by means of barometer, applications. Air-pump; Water pump. Pressure of a gas: Boyle's Law.

Temperature. Liquids expand by heat; the special case of water. Thermometer used for measuring temperature by observing change of volume of liquid. The mercury thermometer; method of graduating; determination of fixed points; fundamental interval; the Centigrade and Fahrenheit scale. Thermal expansion of solids, liquids and gases.

Distinction between heat and temperature. Heat as a quantity and how it may be measured; the thermal unit; specific heat. Changes of physical state due to heat. Fusion and latent heat of fusion; evaporation and ebullition and latent heat of evaporation. Water vapour present in the atmosphere and determination of its amount. Cooling produced by solution and evaporation; freezing mixtures. The conduction and convection of heat; convection currents in the atmosphere and ocean; the trade winds; land and sea breezes and gulf stream. The circulation of water vapour in the atmosphere, clouds, rain.

Light. Rectilinear transmission. Rays and pencils of light, shadows, etc., produced by different sources, and images of sources produced by pin-holes. The laws of reflection of rays of light; reflection of pencils by plane mirrors and images formed by plane mirrors. Direct reflection of pencils from concave spherical mirrors; experimental proof of law of distances. The laws of refraction of rays of light; refraction of rays through a plate and a prism. Refraction through a convex lens; experimental proof of law of distances; the principal focus of a lens. Image formed by a convex lens; the simple microscope: the photographic camera; the telescope. Analysis of white light by a prism; the method of producing, and order of colours in the spectrum. The spectrum of sun-light, and of candle light. Recombination of the colours of the spectrum into white light.

Electrification by friction; positive and negative electrifications. Laws of attraction and repulsion. Conductors and non-conductors. Simple voltaic cell; Grove's cell. Electric current. Magnetic effects of currents in straight and coiled wires. Simple galvanometer. Heating effects of currents. Simple facts of electrolysis.

Magnetic substances. Laws of magnetic attraction and repulsion. Magnetic induction. Methods of magnetization.

Graphic representation by use in squared paper of the relation between any two of the physical quantities referred to in the syllabus.

2. *Chemistry.*—Examples of mixtures and solutions; (1) sand and sugar, (2) sulphur and iron filings, (3) sand and sal-ammoniac, (4) copper sulphate and water. Explanation of the process of separating the ingredients of these mixtures, filtration, decantation, mechanical or magnetic separation, evaporation, distillation, sublimation.

Chemical compounds. Characteristic differences between compounds and mixtures; illustrations.

Chemical combination illustrated by (1) candle burning in air, (2) sulphur burning in air, (3) magnesium wire burning in air, (4) quicklime combining with water.

Chemical decomposition illustrated by (1) heating mercuric oxide, (2) action of sodium on water, (3) heating potassium chlorate, (4) heating lead nitrate.

Iron in contact with air and water is converted into rust. Rusting is oxidation. Copper, lead, mercury, magnesium, sulphur and phosphorus also oxidize; but their oxidation takes place at different temperatures. Rapid oxidation. Combustion of candle; the products of the combustion are heavier than the candle itself. One of these products is a gas which turns limewater milky and it is the same product which is obtained when charcoal burns in air. Water is another product of the combustion. Similar observation may be made and similar conclusions deduced when oil burns in air. Structure of a candle flame.

The rust or oxide is always heavier than the substance from which it is formed. When a substance (*e.g.*, iron or phosphorus) oxidizes in a confined volume of air about one-fifth of the air ultimately disappears. Remaining air is inactive (*e.g.*, candle will not burn in it.) Composition of air: air has two components: active (oxygen) and inactive (nitrogen).

Oxygen; its discovery; its mode of preparation and properties. Oxides; products formed when a candle, charcoal, sulphur, phosphorus, sodium or iron burns in oxygen. Burning in oxygen and air compared. Illustration of acid and alkaline properties.

Hydrogen produced by the action of sodium on water. Products of the decomposition. Same gas is produced when dilute sulphuric or hydrochloric acid acts on zinc, or on iron. Properties of hydrogen: its density and its combustion with air or oxygen. Water the sole product of their combustion.

Elements and compounds: Two ways of determining the composition of compounds (i) by synthesis, (ii) by analysis; illustrated by the case of water. Synthesis of water (i) by burning hydrogen in air or oxygen, (ii) by passing hydrogen over heated copper oxide. Analysis or decomposition (i) by action of sodium on water, (ii) by passing steam over red-hot iron filings, and (iii) by electric current. Composition of water by weight and by volume. Constancy of composition of chemical compounds illustrated by the case of water. Solvent action of water: crystallization, forms of crystals, water of crystallization. Solubility of gases in water, carbonic acid gas, air, and oxygen. Soda-water, spring, river, well, and sea-water. Suspended and dissolved impurities. Purification by distillation. Extraction of salt from sea-water by evaporation: salt pans.

Carbon; the different forms in which it occurs, their properties and uses. Carbon burnt in air or oxygen produces carbon dioxide. This gas is always formed when candles, oil, etc., burn. Its preparation and properties. Action on lime-water. Exhaled by living animals; action of plants on carbon dioxide. Solution of carbon dioxide in water and properties of the solution. Hard and soft water; permanent and temporary hardness. Methods of softening hard water.

Nitrogen, the inactive constituent of air; preparation and properties. Two of its important compounds, viz., nitric acid and ammonia.

(*a*) Nitric acid, its preparation from nitre and sulphuric acid. Its properties; power of dissolving copper and mercury and many other metals. Relations between acids, bases and salts illustrated by (1) nitric acid and caustic soda, (2) magnesium oxide and sulphuric acid, (3) lime and hydrochloric acid.

(*b*) Ammonia, its preparation and properties. Solubility in water; power of neutralizing acids and forming salts, such as ammonium chloride and nitrate; behaviour of these salts on heating.

Hydrochloric acid and chlorine. Treatment of common salt with sulphuric acid and production of hydrochloric acid gas. Properties of this gas; solubility in water. Production of chlorine from hydrochloric acid and manganese dioxide. Its properties; its power of combining with hydrogen and with metals, such as antimony, to form chlorides. Bleaching action of chlorine.

Sulphur; the different forms; their properties. The changes induced by heat—when burnt in air or oxygen produces sulphur dioxide. Sulphuric acid—its properties and uses.

Phosphorus; the different forms, their properties and uses.

Silicon; occurrence in nature. Chief compound silica. Occurrence of silica in nature, free and combined as silicates. Chief forms of silica, quartz, sandstone, flint.

Metals and non-metals, their general properties.

Sodium and potassium; their occurrence and properties. Distinguishing properties of the alkali metals; their more important compounds; common salt, Glauber's salt, washing soda, sodium bicarbonate, caustic soda, potassium carbonate, potassium chlorate, caustic potash, saltpetre, potassium permanganate. Gunpowder.

Calcium. Chief compound calcium carbonate. Its occurrence and various forms. Limestone burnt into lime in limekilns. Slaked lime. The use of lime in making mortar and plaster. Calcium sulphate; gypsum and plaster of Paris.

The occurrence, general method of preparation, properties and uses of the following Metals:—

Zinc, iron, copper, mercury, lead and silver. Their chief oxide and their salts which have been used or produced in experiments and illustrations included in the above syllabus.

Syllabus for the History of Great Britain and Ireland

Pre-Norman Period.—The early inhabitants of Britain: their modern descendants; what languages they speak; where they live. The Roman occupation; Agricola. The coming of the English; their original homes; their chief tribes. The conversion of the English. Celtic and Roman Christianity; the supremacy of the latter; reasons and results. The struggle for supremacy between the Heptarchy Kingdoms: the supremacy of Wessex. The coming of the Northmen: who they were; the results of their coming. The struggle between Wessex and the Northmen: the victory of Wessex. Alfred: Athelstan: Edgar: Dunstan. The Danish conquest: reasons: Canute. The English line restored.

The Norman and early Plantagenet Period.—The Norman conquest; its causes and effects. Character of the Norman kings and of their rule. Feudalism. The opposition of the baronage to the royal power. The anarchy of Stephen's reign. Order restored by Henry II. His aims: his quarrel with Becket: reasons and results. The Reforms of Henry II. His foreign possessions; extent. His quarrel with the barons. The loss of Normandy: its effects. The baronage of a national party; struggle with John; the Great Charter. The weak rule of Henry III; subservience to

the Papacy: foreign favourites. The barons' war: Simon-de-Montfort, his character and aims. Revival of the monarchy under Edward I., effect of the baronial war seen in his reforms. The beginning of Parliament. The conquest of Wales. the attempted conquest of Scotland and France. Edward II's reign. Bannockburn: temporary supremacy of the baronial party.

The later Plantagenets.—Edward III's reign. The Hundred Years' War: causes: Sluys: Crecy: Poitiers: the treaty of Bretigny: the Black Prince. Increased power of the Parliament. Social and economic changes: the Black Death: its results. Wat Tyler: the peasants' rebellions. The attempted autocracy of Richard II; his overthrow. Literary activity; Langland, and Chaucer. The Lancastrian kings, the strength of Parliament at the beginning. Beginning of dynastic troubles. Early religious reforming movement; Wycliffe: the Lollards. Rebellions against Henry IV. Renewal of the Hundred Years' War: reasons: Havre, Agincourt: the treaty of Troyes. The minority of Henry VI; failure in the Hundred Years' War; reasons; close of Hundred Years' War: effects. Renewed social troubles. Outbreak of dynastic Wars of the Roses: causes: chief events. Warwick, the King-maker. The Yorkist Dynasty: its character and aims; reasons for its power. The effects of the Hundred Years' War on English political, commercial and social life.

The Tudor Period.—The strength of the Tudor possession of the throne. Their despotic rule. The overthrow of rival claimants. The final suppression of the old baronage. The creation of a new subservient baronage. The need for peace. Henry VII's Policy. Henry VIII's character. The career of Wolsey: foreign policy. Ecclesiastical reform: the Reformation in England: its causes. The overthrow of the Papal authority. The phases of the Reformation in England under Henry VIII, Edward VI, Mary and Elizabeth. Comparison with continental reformation: Luther and Calvin. Social results of the Reformation: the rebellions under Edward VI: Elizabeth's poor law. The jealousy of England and Spain: causes; English navigators; the development of English commerce. Elizabeth's foreign policy: the war with Spain: its results. Literary activity of the sixteenth century: its connection with the Reformation and the Renaissance. The three religious parties under Elizabeth: the Roman Catholics: the Anglicans: the Puritans: their aims and characteristics: chief sects of Puritans. The Anglicans supreme: policy of uniformity: absence of idea of toleration. The Puritans and royal political supremacy.

The Stuarts.—Kings and Parliament. The difference between the absolutism of the Tudors and the Stuarts. Suppression of the Roman Catholics: attempted suppression of the Puritans by James I. Growing hostility to royal power: the influence of Puritanism in the party of opposition. The chief points of dispute between the Crown and Parliament. The failure of Charles I's foreign policy: increased opposition met by further claims of the prerogative. The Petition of Right.

Temporary victory of the Crown. Renewed opposition over ship-money and Laud's religious policy. The Bishops Wars. Summons of Parliament. Early acts of Long Parliament. Outbreak of War: immediate and remote causes. Chief events of the war. The victory of the Parliament; reasons. Breach between the Parliament and the Army. The execution of Charles I. The Commonwealth: rule of Puritan minority. Cromwell in Ireland and Scotland. The Protectorate: Cromwell's character and aims. Reasons of his success and of the failure of his system. The Restoration: why possible. Net gains of the Rebellion. Puritan Literature: Milton: Bunyan. The despotic and catholic policy of Charles II and James II: the ministers of Charles II: his French intrigues. The Whigs and Tories: their respective aims. The Exclusion Bill. Temporary triumph of absolutism. Its overthrow at the Revolution: James' rashness compared with Charles' discretion.

The Bill of Rights: the triumph of Parliament. James II in Ireland: William III and Scotland. The beginnings of Party Government under William III and Anne: the unscrupulousness of party politicians: Harley: St. John: Marlborough. The reforms of William III: the Act of Settlement. The wars with France: causes. Marlborough as a general: the chief battles of the war. The treaty of Utrecht: English colonial gains.

The Hanoverian Period.—The Whig supremacy: Reasons for the discredit of the Tories. The 1715 rebellion. The rise and power of Walpole: his policy and methods. The establishment of Party Government with Prime Minister and Cabinet. The reasons for Walpole's long tenure of Office. The rise of an opposition. The Family Compact: hostility with Spain and France: reasons. Overthrow of Walpole. Whig supremacy continued with a war policy. The rise of the elder Pitt. The war of the Austrian succession: England's share in it; Colonial rivalry of France and England. The Seven Years' War: its phases: chief events. English gains in 1763. Pitt as a popular minister: his character and aims. The colonial policy of Pitt's successors: the loss of the American colonies. Chief events. Overthrow of the Whig supremacy; reasons for the weakness of the Whig party. Final check to royal control of politics.

II. *The Revolutionary Period.*—The Tory rule of the younger Pitt. Internal reforms and domestic policy of Pitt: comparison with the policy of Walpole. The outbreak of the French Revolution: Pitt forced into war. The revolutionary and Napoleonic wars: Chief events on sea and land. Death of Pitt: his character.

Nelson and Wellington: their careers and characters. Reasons for the success of England at sea. The role played by England in resisting the Napoleonic schemes. The downfall of Napoleon. Religious and literary activities of the period: Wesley. Burke. The industrial development: its nature and causes.

The 19th Century.—(1815—1902): The influence of the French Revolution in England. The great period of reform. Economic and social evils: their causes and remedies: riots: socialist movement: the Chartists: the repeal of the corn laws: Sir Robert Peel: Cobden and Bright and free trade: factory laws: the spread of education. Political reform: the extension of the franchise: Cabinet government: municipal reforms. Great ministers of the period: Russell: Palmerston: Disraeli: Gladstone; Salisbury. Colonial expansion during the period. Wars of the period; mainly frontier and colonial: the Crimean war: the Boer war: causes: results and chief events. The life and influence of Queen Victoria. Great poets and novelists of the century.

Syllabus in Indian History

The Pre-Mussalman Period:—

1. Physical configuration of India. Distribution of land and water: mountains, rivers and the sea. Position in relation to the rest of the world. Historical consequence of the foregoing.

2. The aboriginal and non-Aryan races.

3. The Indo-Europeans (so-called Aryans). Their immigrations and settlement. Aryan culture. Social and economic conditions. Caste (till circa 500 B.C.).

4. Social, economic, religious and political conditions in the sixth century B.C. Jainism and Buddhism. The growth of the kingdom of Magadha.

5. The satrapy of Darius (circa 500 B.C.). The invasion of Alexander. Its consequences and results.

6. Break-down of local independence. The Mauryan empire. Chandragupta. Asoka. Social, religious and economic conditions under the early Mauryans.

7. The disruption of the Mauryan empire. Rivalry between Brahmanism, Buddhism and Jainism and the Prakrit dialects and Sanskrit. The Sunga, Kanva and Andhra dynastics (circa A.D. 250).

8. Foreign influences, invasions and immigrations, Indo-Greek, Indo-Bactrian, Indo-Parthian, and Indo-Scythian dynasties. Revival of Buddhism. Kanishka's empire. Græco-Roman influence. The Great Satraps of the West. Religious and social conditions (till circa A.D. 300).

9. The Gupta dynasty and empire. Brahmanic revival. Literary activity. Religious and social conditions. Fa Hian.

10. The Huns, break up of the Gupta Empire.

11. The reign of Harshavardhana. Social, economic and religious conditions (till circa A.D. 650). Hiouen Thasank. The early Chalukyan empire in the Dekhan. The Pallavas in South India.

12. Minor local dynasties in North India—Kabul, Punjab, Sindh: Magada, Kanouj, Delhi: Behar and Bengal: Bundelkhand and the Central Provinces: Ajmir, Malwa and Gujarat.

13. The empire of the Dekhan to circa A.D. 1300—The early Chalukyas, the Rashtrakutas, the later Chalukyas and the Yadavas of Devagiri.

14. The South Indian supremacy. The Pallavas. The Chola supremacy. Cheras and Pandyas. The Hoysalas and the Kakatiyas. Economic and social conditions. Dravidian literary and religious activity.

Mediæval India (*to circa* 1761):

1. Early Muhammadan invasions.

2. Mahamud of Ghazni, Mahamud Ghori. The Slave, Khilji and Tuglakh, Shahi dynasties. Social, religious and literary conditions (circa A.D. 1400).

3. Break up of the empire of Delhi. Local Muhammadan dynasties in Jaunpur, Bengal, Malwa and Gujarat.

4. The Bahmini kingdom of the Dekhan: its break up, 1526: final conquest and absorption by the Mughal Empire.

5. History of the empire of Vijayanagar till A.D. 1565. The successors of Vijayanagar to circa 1750.

6. Rajputana till A.D. 1556.

7. The Great Mughals 1526-1707.

8. The Marathas to 1714.

9. Routes of Indo-European trade. The Saracen conquests, and the results on Indo-European commerce. The age of discovery. The Portuguese in India. Albuquerque. Causes of the decline of Portuguese power in India (till circa 600).

10. The decline of the Mughal empire, 1707-1761. The Maratha conquests, 1714-1761. Rise of the Sikhs. Panipat.

Modern India (*down to the death of the Queen-Empress*)

1. Importance of sea power in Indian History. Early English attempts to reach India. Rivalry between the Dutch and the English till 1623. The French in India till 1741.

2. The Karnatic Wars. Dupleix and Clive. French supremacy in South India. The English in Bengal. The Black Hole tragedy. Plassey. Final French attempts. Coote and Lally (till 1761).

3. The administration of Bengal, 1758-1771.

4. Rise of Haidar Ali. The First Mysore war, The revival of the Maratha confederacy. Madhava Rau, Peshwa (till 1772).

5. Warren Hastings.—English politics and Indian affairs (1748-72). The Regulating Act. Rohillas. Benares. The first Maratha and second Mysore wars. Effects of the American war. Suffren on the Indian seas. The First Armed Neutrality. Successful end of Hastings' administration. His work. Pitt's India Bill.

6. Cornwallis and Sir John Shore.—The Mysore war. Economic and administrative reforms. The policy of non-intervention.

7. Wellesley.—England and revolutionary France. War with Tippu. The second Armed Neutrality. The battle of Aboukir Bay. The Subsidiary System. Second and third Maratha wars. Minor reforms. Wellesley's work.

8. Cornwallis and Minto. Administrative reforms. Conference of Tilsit. Capture of Java.

9. Marquess of Hastings and Lord Amherst. Ghurka war. The Pindari war. Last Maratha war. Extinction of the Peshwaship. First Burmese war. The Bhartpur affair. Internal affairs.

10. Bentinck.—His reforms.

11. Auckland and Ellenborough.—Rise and history of Ranjit Singh. Afghanistan and the Punjab. The first Afghan war and the 'avenging expedition.' Conquest of Sindh. Gwalior affairs.

12. Hardinge and Dalhousie.—The first and second Sikh wars. Annexation of the Punjab. The second Burmese war. The 'doctrine of lapse.' Dalhousie's annexations. Railway and Telegraph.

13. Canning.—The Mutiny. Canning's clemency. The Queen's proclamation. India under the Crown. Financial and Military reforms.

14. India under the Crown to the death of the Queen Empress Victoria.

Geography.

I.—Southern Continents.

Australia.

1. Relief and Rivers of Australia.

2. Climate of Australia. The seasonal distribution of temperature and rainfall.

3. Vegetation and animals; relation between rainfall and natural vegetation regions of Australia; peculiarity of its animal life.

4. Life and work of the people with special reference to (*a*) East Coast Region, (*b*) Murray-Darling Basin, (*c*) Mediterranean regions of West Australia and Victoria.

5. Favourable position for trading with lands around the Pacific and Indian Oceans.

Africa.

6. Structure—effect upon the coastline, rivers and lakes of Africa, relief and drainage.

7. Climate and vegetation of Africa; apparent seasonal migration of the sun and the duplication of climatic and vegetation belts North and South of the Equator.

8. Chief Natural Regions of Africa.

9. Peoples of Africa.

10. Trade routes of the Indian Ocean.

South America.

11. Structure and relief; rivers.

12. Climate and vegetation of South America; the effect of a mountain barrier, of a cold current and of altitude upon rainfall and temperature; Andean Zones.

13. Peoples and States of South America; the importance of minerals in the past and present development of the continent.

14. Temperate countries of South America—Argentina, Uruguay and Chile.

15. Tropical countries of South America—Brazil—the world's chief Storehouse of tropical products.

16. Revision of the three southern continents.

II.—North America.

1. Structure and relief; the work of rivers as illustrated on a large scale by the Colorado and Mississippi and as seen by actual observation of local streams.

2. Climate and vegetation; factors that modify climate as evidenced in North America; natural regions of North America.

3. Population and political divisions; immigration.

4. *United States*—

(a) North-eastern industrial and commercial region.

(b) South-eastern plantation region.

(c) Central farming region.

(d) The basins and mining regions of the Rockies.

(e) Pacific shorelands—fruit, grain, timber and minerals.

5. *Dominion of Canada and Newfoundland*—

(a) Eastern Canada—agriculture, dairying, timber, fisheries, mining and manufacture.

(b) Prairie provinces.

(c) British Columbia.

6 Mexico, Central America and West Indies.

7. Transport and communication of North America and important links in round-the-world routes.

III.—Eurasia and India.

1. Surface, relief and rivers of Eurasia.

2. Climate of Eurasia ; the major climatic regions, comparison of temperature; conditions on east and west margins ; effect of latitude and distance from the sea on range of temperature, causes of monsoons and their effect on climate of South-east Eurasia.

3. British Isles ; relief ; influence of the sea and the climate upon the life and activities of the people ; fisheries and farming ; the chief industrial regions and their outlets.

4. Western Mainland of Europe.—France—agriculture and industry ; position of Paris and Marseilles. Belgium—plain of Flanders and the Sambre-Meuse Valley. Holland—a delta land reclaimed from the sea ; its colonies and sea trade. Denmark—co-operative dairy farming. Germany—plain and plateau, forestry and development of special industries ; industries of the Ruhr and Saxon coalfields.

5. Baltic Region—the new border states, Scandinavian peninsula—forestry and woodwork of Sweden.

6. Central Highlands of Europe ; Czecho-Slovakia—its minerals and industries ; agriculture of the Mid-Danubian plain. Alpine region—development of hydro-electric power and effect on industrial development.

7. Mediterranean region—influence of climate on plant adaptation and fruit culture. Spain—its mineral wealth but lack of coal. Italy—alluvial plain of Lombardy and its industrial development—peninsular Italy.

8. South-western lands of Asia—region of plateau and deserts with one important alluvial plain ; its historical importance as a highway.

9. Central and Northern Eurasia—rich wheat and pasture lands of Rumanian and Russian plains—desert conditions of the Aral Sea Basin; tundra, taiga and steppe of Siberian plain, contrast development of this region with similar region in North America.

10. China—her dependencies. Effect of climate and relief upon occupations and industries.

11. Japan. A mountainous country, yet productive; agricultural, mineral and industrial development—importance of Korea.

12. South-east Asia and the East Indies.

13. Position, relief, soils and minerals of India and Burma.

14. Climate of India; her chief climatic regions; means of irrigation.

15. Vegetation and animal life of India.

16. Peoples of the Indian Empire.

17. Survey of the Provinces and States—

(a) Mountain States.

(b) Great Plain.

(c) Plateau states and provinces.

(d) Madras.

(e) Bombay.

18. Occupations and industries of India.

19. Trade, transport and seaports.

20. Ceylon.

IV.—The World.

1. Studies in climate—size and shape of the earth—movements of the earth, day and night, the seasons, annual and seasonal distribution of temperature, pressure, winds and rainfall, ocean currents, natural vegetation.

2. Regions of the world—

(1) Tundra and Ice-cap.

(2) The Cold Forests.

(3) Broad-leaved Forests.

(4) Temperate grasslands.

(5) Mediterranean Lands.

(6) Desert Lands.

(7) Equatorial forests and tropical grasslands.

(8) Monsoon Lands.

(9) Islands of the Pacific.

(10) High mountain and plateau.

(11) Industrial Regions of Europe.

(12) Industrial Regions of North America.

(13) Regions of the Empire.

Books recommended.

Text-Books—

(1) The New Regional Geographies—Book IV, The World, Leonard Brooks ; London University Press.

(2) Any one of the following :—

(a) India, World and Empire, Herbert Pickles ; Oxford University Press.

(b) Our World, Morrison ; Macmillan.

(c) இந்திய ராஜ்யம் ஸம்மளம், Morrison and Subrahmanyam Macmillan.

(d) The World, Dudley Stamp; Longmans, Green & Co., (1929 edition).

Reference books.—

(1) Physiography, Herbertson; Oxford University Press.

(2) Every one's Book of the Weather, Franco Williams Sheldon Press.

(3) Out-door Geography, Hatch ; Blackie.

(4) Surface of the Earth, Pickles ; Cambridge University Press.

(5) Human Geography for Secondary Schools, Fairgrieve and Young ; G. Philip and Son.

(6) A Graded Course of Geography, E. S. Price ; G. Philip & Son.

(7) The Rambler Travel Books ; Blackie.

(8) The World, Howarth & Bridewell ; Oxford University Press.

(*b*) TEXT—BOOKS.

1932

ENGLISH.

1. *Text-books of which a detailed knowledge will be required.*

The selections in English Poetry and Prose for the S.S.L.C. Public Examination of 1932, published by the University of Madras. (Copies are available at Messrs. E. M. Gopalakrishna Kone & Sons. 161, Broadway, Madras.)

2. Text-books of which a detailed knowledge *will not be required.*

(1) Socrates in an Indian Village by Brayne (Special edition for S.S.L.C. Examination (Oxford University Press, Mount Road, Madras).

(2) Vas-co-de gama by M. T. Yates (Temple continuous Readers Series, Macmillan & Co., Ltd., Mount Road, Madras).

PHYSICS.

Millikan and Gale, 1st Course in Physics.

HISTORY.

English History: 1485 to 1688.

Indian History: (The Moghul Empire)—1526 to 1707.

SANSKRIT, 1932 & 1933.

S.S.L.C. Selections in Sanskrit (Group A) for 1932 and 1933 published by the University respectively.

MARATHI, 1932.

Prose—

Amachya ayushhyatil athavani, pages 1—186.

Poetry—

The following extracts from Navanit:

Moropant—Karnaparva, pages 330—346.

Waman Pandit—Sphuta Shloka, pages 133—143.

N.B.—The above books can be had at New Kitab Khana, Poona City, or Messrs. Parachure Puranick and Company, 'Madhav Bagh'. Bombay.

ORIYA, 1932.

S.S.L.C. Selections in Oriya (Group A) for 1932 published by the University.

HINDI, 1932.

Shakuntala by Maithli Sharan Gupta (Sahitya Sadan, Chirgaon, Jhansi, U. P.).

Galpa Guchha, Part I, pp. 1 to 81 (Indian Press, Ltd., Allahabad).

Anatha Balak by Trivedi (Indian Press, Ltd., Allahabad).

1933.

Hindi Ratna Sangrah by Sundarshan Acharya, omitting Ramachanderjee Ka Vangaman (pp. 88 to 95). (Griha Lakshmi Karyalaya, Allahabad).

Bhasha-Sar-Sangrah, Part I, omitting Robinson Crusoe Ka Itihas (pp. 24 to 31), and Shri Ramachanderjee Ka Vanavas Ko Chalna (pp. 148 to 176). (Indian Press, Ltd., Allahabad).

Bal Ramayan (Indian Press, Limited, Allahabad).

LATIN, 1932.

Cæsar: De Bello Gallico, Book I, Chapters 30—54.
Phædrus: Fables. Book I. (Macmillan's Elementary classics).

FRENCH, 1932.

Daudet: Lettres de mon Moulin. (O. U. P. Edition—Full text to be studied).

Poèmes Choisis 39—54, (Ed. du Pontet—Published by Arnold).

GERMAN, 1932.

Text-books will be prescribed, if required.

ARABIC, PERSIAN AND URDU, 1932.

Arabic—

Mirqát-ul-Adab.

Persian—

Gulistán—Chapters 4, 7 and 8.

Urdu—

Prose and Poetry—
Nayrang-i-Urdu.

Non-detailed—
Hayhatnak Afsanay.

TAMIL, TELUGU, KANARESE AND MALAYALAM.

Selections for the S.S.L.C. Examination, 1932—**Group A**—published by the University in the respective languages.

APPENDIX II

INTERMEDIATE EXAMINATION IN ARTS AND SCIENCE.

(a) Syllabus

(1) MATHEMATICS.

In addition to the subjects prescribed for the Matriculation, the courses shall comprise Algebra, Plane Trigonometry and Geometry. A candidate shall be required to be acquainted with the use of logarithmic tables and to be able to solve questions by graphic methods, and to have an experimental knowledge of the simple geometrical solids and their sections.

(a) *Algebra.*—Algebraical laws and principles and their applications. Ratio and proportion. Theory of indices. Variation. Simple surds. Equivalence of system of equations. Solution of equations of the second degree in one or two variables and of equations of higher degree whose solution depends on them. Theory of the equation and expression of the second degree in one variable. The three progressions and other series whose summation depends on arithmetical and geometrical series. Interest and annuities. Permutations and combinations. The Binomial theorem for a positive integral exponent and direct applications of the theorem for any exponent. Elementary theory of logarithms and their applications to arithmetical computation. Problems on the above.

(b) *Plane Trigonometry.*—Measurement of Angles. Trigonometrical functions and their relations to one another. Solution of simple trigonometrical equations. Addition, multiplication and division formulæ. Properties of triangles and of the circles connected with them. Solution of triangles. Application of logarithms to trigonometrical computations. Measurements of heights and distances.

(c) *Geometry—Experimental.*—Construction of scales and their use. Construction of similar figures. Construction of the circumscribed, inscribed, escribed and other associated circles of triangles, and polygons. Constructions from data of triangles, quadrilaterals and polygons and their division in any given ratio. Areas of polygons and problems relating thereto.

Theoretical.—Ratio and proportion. Similar figures, Concurrence and collinearity. Properties of triangles, Properties of circles. Loci. Elementary maxima and minima. Proofs of the constructions in *Experimental Geometry.* Easy deductions.

DETAILED SYLLABUS IN THEORETICAL GEOMETRY.

N.B.—*The order in which the theorems are stated in this Syllabus is not imposed as the sequence of their treatment.*

Ratio and Proportion.—Definition and elementary theorems connecting the antecedents and consequents.

A given straight line can be divided internally in a given ratio at one, and only one point; and externally at one, and only one point.

A straight line drawn parallel to one side of a triangle cuts the other two sides, or those sides produced, proportionally; and the converse.

If the vertical angle of a traingle is bisected internally or externally, the bisector divides the base internally or externally into segments which have the same ratio as the other sides of the triangle: and the converse.

In equal circles, angles, whether at the centres or circumferences, have the same ratio as the arcs on which they stand.

Triangles and parallelograms of equal altitude are to one another as their bases.

If two triangles have one angle of the one equal to one angle of the other, their areas are proportional to the rectangles contained by the sides about the equal angles. Similarly for parallelograms having one angle of the one equal to one angle of the other.

Similar Figures.—If two triangles are equiangular their corresponding sides are proportional: and the converse.

If two triangles have one angle of the one equal to one angle of the other and the sides about these equal angles proportional, the triangles are similar.

Two triangles are similar, if the sides of the one are respectively parallel or perpendicular to the sides of the other.

If two triangles have two sides of the one proportional to two sides of the other, and an angle in each opposite one corresponding pair of these sides equal, the angles opposite the other pair are either equal or supplementary.

If from the right angle A of a right-angled triangle ABC, AD is drawn perpendicular to BC, then (1) AD is the mean proportional between BD and DC, (2) BA is the mean proportional between BD and BC and (3) CA is the mean proportional between CB and CD.

If two triangles are similar, their corresponding lines (such as medians, altitudes, inradii, etc.) are to one another in the ratio of their corresponding sides.

Similar triangles are to one another as the squares on their corresponding sides.

Two similar polygons can be divided into the same number of triangles similar to each other and similarly placed; and the converse.

The perimeters of two similar polygons are to each other as any corresponding sides.

Areas of similar polygons are proportional to the squares on corresponding sides.

Concurrence and Collinearity.—The use of signs as applied to lines, angles and areas. If two parallel lines are cut by three or more concurrent transversals, the corresponding segments are proportional; and the converse.

If X, Y, Z, are points in the sides BC, CA, AB of a triangle ABC, such that the perpendiculars to those sides at these points are concurrent, then

$$(BX^2-XC^2)+(CY^2-YA^2)+(AZ^2-Z^2B^2)=0\ ;$$

or

$$BX^2+CY^2+AZ^2=CX^2+ZB^2+AY^2,$$

and the converse.

If any transversal meets the sides BC, CA, AB of a triangle in D, E, F, then

$$AF.\ BD.\ CE=AE.\ CD.\ BF;$$

and conversely, if three points D, E, F taken on the sides BC, CA, AB of a triangle, satisfy the relation AF. BD. CE=AE. CD. BF then D, E, F, are collinear.

If the lines joining any point to the vertices A, B, C of a triangle meet the opposite sides in D, E, F;

$$\text{then } AF.\ BD.\ CE=FB.\ DC.\ EA;$$

and conversely, if three points D, E, F, taken on the sides BC, CA, AB of a triangle, satisfy the relation AF, BD, CE=FB, DC, EA, then AD, BE, CF are concurrent.

If two unequal similar figures are similarly placed, the lines joining the vertices of one to the corresponding vertices of the other are concurrent.

Properties of Triangles.—The three medians of a triangle meet in a point, and this point is a point of trisection of each median, and also of the line joining the circumcentre to the orthocentre.

If D is a point in the side BC of a triangle ABC such that BD=1|*n* BC, then

$$(n-1)\ AB^2+AC^2=n.\ AD^2+(1-1/n)\ BC^2.$$

The perpendiculars from the vertices of a triangle on the opposite sides meet in a point, and the distance of each vertex from the orthocentre is twice the perpendicular distance of the circumcentre from the side opposite to that vertex.

The circle through the middle points of the sides of a triangle passes also through the feet of the perpendiculars of the triangle and through the middle points of the three lines joining the orthocentre to the vertices of the triangle.

If a perpendicular drawn from the vertex to the base of a triangle is produced to meet the circumcircle, then the distance of this point of intersection from the base is equal to the distance of the orthocentre of the triangle from the base.

The feet of the perpendiculars drawn on the sides of a triangle from any point P on the circumcircle of that triangle are collinear.

The pedal line of P bisects the line joining P to the orthocentre of the triangle.

If the vertical angle of a triangle is bisected by a straight line which cuts the base, the rectangle contained by the sides of the triangle is equal to the rectangle contained by the segments of the base together with the square on the straight line which bisects the angle.

If from the vertical angle of a triangle a straight line is drawn perpendicular to the base, the rectangle contained by the sides of the triangle is equal to the rectangle contained by the perpendicular and the diameter of the circle described about the triangle.

Properties of Circles.—The locus of the points of intersection of tangents drawn at the extremities of chords of a circle which pass through a fixed point, is a straight line.

If the polar of A passes through B, then the polar of B passes through A.

If P and Q are any two points in the plane of a circle whose centre is O, then OP bears to OQ the same ratio as the perpendicular from P on the polar of Q bears to the perpendicular from Q on the polar of P.

The locus of points from which the tangents to two given coplanar circles are equal is a line perpendicular to the line of centres.

In two circles, if any two parallel radii are drawn (one in each circle), the straight line joining their extremities cuts the line of centres in one or other of two fixed points called (centres of similitude).

If through a centre of similitude of two circles, a line is drawn cutting the circles, the radii to a pair of corresponding points are parallel.

If through a centre of similitude S of two circles, a line is drawn cutting the circles, then the rectangle under the distances of one pair of non-corresponding points from S is equal to the

rectangle under the distances of the other pair of non-corresponding points from S; and each of these rectangles is constant.

In a cyclic quadrilateral the rectangle contained by the diagonals is equal to the sum of the rectangles contained by the opposite sides.

Loci.—If from a fixed point O a variable line is drawn, and in it points P, Q are taken, so that the ratio of OP to OQ is constant then (1) if P moves along a straight line, the locus of Q is a parallel straight line; (2) if P moves along the circumference of a circle, the locus of Q is a circle.

The locus of a point which is such that the rectangle under its distances from the equal sides of an isosceles triangle is equal to the square on its distance from the third side, is the circle which touches equal sides at the extremities of the third side.

If A, B are fixed points, and P a variable point, such that the ratio of PA to PB is one of constant inequality, then the locus of Q is a circle.

Given the base and vertical angle of a triangle, find the locus of (1) its incentre, (2) orthocentre, (3) centriod, (4) excentres.

If a triangle ABC of given species has one corner A fixed, another B always on a fixed line or circle, then the locus of C will be a line or circle.

Elementary Maxima and Minima.—When two sides of a triangle are given in length, the area of the triangle is greatest when they are placed at right angles.

The maximum triangle which can be inscribed in a given segment of a circle is that formed by joining the middle point of its arc to the extremities of its chord.

If A, B are two fixed points, and XY a fixed line; then for that point P in XY at which AP, BP make equal angles with XY,

(1) $AP \times PB$ is minimum, if A, B are on the same side of XY.

(2) $AP \times BP$ is maximum, if A, B are on opposite sides of XY.

If A, B are fixed points and P any point in a fixed line, the angle APB will be maximum, when the circle APB touches the fixed line.

Of all triangles having the same base and equal area the isosceles triangle has the minimum of perimeter.

The maximum of isoperimetric triangles on the same base is the one whose two side are equal.

Of all polygons having all sides given but one, the maximum can be inscribed in a semi-circle having the undetermined side as diameter.

Of all isoperimetric polygons of the same number of sides, the equilateral is the maximum.

If P is any point in a given straight line AB, AP. PB is maximum and AP^2+PB^2 is minimum when P is the middle point of AB; of all rectangles, of given area, the square has the minimum perimeter.

The maximum parallelogram which can be inscribed in a triangle by drawing parallels to two of its sides, is that formed by drawing the parallels from the middle point of the third side.

(2) PHYSICS.

Theory

No question shall be asked which cannot be answered by simple mathematical methods.

The course shall include a more detailed study of the matter included in the Matriculation syllabus and in addition the following:—

Dynamics.—The units of length and time. Displacement, speed, velocity and acceleration of a particle moving in a straight line. Newton's laws of motion; the units of mass and force. Motion of a particle in a straight line under the action of a force in that line. Motion under the action of gravity. Energy, work, power and their units; simple illustrations of the conservation of energy.

*Conditions of equilibrium of a body under three concurrent forces (the parallelogram law), and under parallel forces. Centre of gravity. Simple machines. The simple pendulum; determination of *g*.

Hydrostatics.—Pressure at a point in a fluid; definition and illustrations; transmissibility of pressure. Evaluation of pressure at a point in a heavy fluid at rest; its uniformity in all directions. Resultant thrust in simple cases. The principle of Archimedes, floating bodies, and hydrometers. Applications to practical determination of density and specific gravity. The pressure of a gas and its determination; the barometer. Boyle's law; air pumps and water pumps.

Heat.—Temperature and its measurement; the construction and graduation of thermometers. The thermal expansion of solids, liquids and gases and their accurate determination; the air thermometer. Heat as a quantity; the unit of heat, specific heat and the more direct methods of calorimetry. Laws of fusion, evaporation and ebullition; latent heat. Vapour pressure and how it is measured; hygrometers. Conduction

and convection of heat; thermal conductivity. Radiation; absorption and reflection; law of cooling. The dynamical equivalent of heat and its determination.

Light.—The experimental facts and laws of transmission, reflection and refraction of light; simple geometrical deductions from these, applicable to small direct pencils incident on plane and spherical surfaces, prisms and lenses. Applications to optical lantern, spectacle lenses, telescope and microscope. Total reflection. Dispersion of light; the spectrometer. Radiation and absorption spectra. Determination of refractive indices.

Magnetism.—Properties of magnets: poles. Laws of magnetic force; unit poles. Lines of force; uniform magnetic fields and experimental methods of comparing them. The earth's magnetic field; the compass. Magnetic induction; the magnetic properties of iron and steel.

Electricity.—The more common forms of voltaic cells and the actions that go on in the cells while producing a current. The action of currents on magnets; galvanometers depending on such action including suspended coil type. Metallic conductors and electrolytes; laws of electrolysis. Electromotive force; Ohm's law: resistance and simple methods of measuring *e.m.f.*, current and resistance; Wheatstone's bridge. Heating effects of current; fuses and lamps; Joule's law. The Electro-magnet and its simpler applications.

Sound.—The production and propagation of sound; the velocity of sound in air and its determination. Nature of wave motion and sound waves. Frequency of vibration; pitch. Amplitude of vibration; loudness. *Laws of vibration of strings and air columns. The reflection of sound; echoes.

N.B.—Asterisk* before a para. in a sentence means that for the topics included "only experimental proofs are required."

In the above the asterisk applies to the whole of para. 2 under Dynamics and to "Laws of vibration of strings and air columns." under Sound.

Practical Physics for the Intermediate course.

The following scheme is not exhaustive, but is intended to indicate the general nature and extent of the Courses of Instruction in Practical Physics for the Intermediate Examinations:—

Course of Instruction in Practical Physics.—

Length measurements by millimeter scale, vernier, micrometer-gauge and spherometer.

Measurement of areas and volumes.

Verification of conditions of equillibrium of a body under coplanar forces.

Determination of the centre of gravity of a plate.

Verification of the law of a simple pendulum: determination of g.

The inclined plane; pulleys.

Use of balance, sensitive to ·01 gram.

Determination of volumes by weighing in water; determination of capacities of vessels.

Specific gravities of solids and liquids; hydrometers.

Reading Fortin's barometer and correcting for temperature.

Verification of Boyle's law.

Determination of fixed points of thermometer.

Determination of co-efficient of expansion of a rod.

Determination of co-efficient of apparent expansion of a liquid.

Expansion of air at constant pressure.

The constant volume air thermometer.

Curves of cooling.

Melting points.

Determination of specific heats of solids and liquids.

Latent heat of water and steam.

Determination of vapour pressures.

Boiling points.

Use of Regnault's (or Dine's) and wet and dry bulb hygrometers.

Comparison of thermal conductivities.

Radiation of heat from different surfaces.

Determination of the Mechanical Equivalent of heat.

Verification of the laws of reflection.

Tracing the path of a ray of light through a block of glass and deduction of refractive index.

Focal lengths of concave mirrors and convex lenses.

Arrangement of 2 lenses for telescope, microscope, and optical lantern.

Measurement by spectrometer of the angle of a prism, and the refractive index for sodium light.

Use of simple photometers.

Tracing the lines of force in a magnetic field.

Comparison of magnetic moments.

Comparison of strength of magnetic field by vibration.

Study of the simple, the Daniell, Leclanche cells; the storage cell and the dry cell.

Absolute measure of current (i) by tangent galvanometer, (ii) by electrolysis.

Measurement of heat developed by current.

Measurement of resistance of wires.

Comparison of electromotive forces.

Verification of laws of transverse vibration of strings.

Determination of velocity of sound by resonance.

Books for Study—

Rintoul, D: Introduction to Practical Physics (Macmillan).

Watson, W: Elementary Practical Physics (Longmans).

Schuster and Lees: Intermediate Course of Practical Physics (Macmillan).

Crowther, J. A: Manual of Physics (Oxford University Press).

Glazebrook: Hydrostatics, Light and Heat (Cambridge University Press).

Hadley: Magnetism and Electricity for Beginners (Macmillan).

Sanderson: Electricity and Magnetism (Macmillan).

Houston: Intermediate Light.

Shackel: { Modern School Electricity and Magnetism. Heat, Light and Sound. }

Nightingale: Light, Heat and Sound.
Nightingale: Mechanics and Hydrostatics.

Houston: Intermediate Physics.

Reference—

Duncan and Starling: Text-book of Physics (Macmillan).

Brown, S. E: Sound (Cambridge University Press).

Krishnaswami, T. S.: Sound (Murthi Brothers).

(3) CHEMISTRY.

The course shall include a more detailed study of the matter included in the Matriculation syllabus and in addition the following:—

The laws of chemical combination by weight and by volume. Atomic theory; symbols and their use. Equivalents. Atomic

weights. Molecular weights. Avogadro's hypothesis and relation of gas density to molecular weight. Chemical equations and calculations; nomenclature.

A general knowledge of the properties of the elements and of the chief types of their compounds with a view to their classification.

The ordinary methods of preparation, and the chief properties of the following elements and their principal compounds:—hydrogen, oxygen, the halogens, sulphur, nitrogen, phosphorus, arsenic, boron, carbon and silicon.

Chief sources, preparation and properties of the common metals, viz., sodium, potassium (ammonium), silver, mercury, lead, copper, zinc, antimony, bismuth, magnesium, calcium, barium, aluminium, iron, manganese, chromium, tin, and the preparation and properties of their oxides, hydroxides and their salts with the more common negative radicals.

Books for Study—

Smith: Experimental Inorganic Chemistry (Bell).

Senter: Text book of Inorganic Chemistry.

Reference—

Smith: Introduction to Inorganic Chemistry (Bell).

Holmyard, E. J.: Inorganic Chemistry (Edward Arnold).

(4) NATURAL SCIENCE.

(*i*) *Botany.*

Intermediate Course—

(1) The main external features, mode of life and place in nature, of the following:—Bacteria, Fungi, Algæ, Lichens, Mosses, Ferns, and Flowering plants.

(2) The external morphology of the following parts:—root, stem, leaf, inflorescence flower, fruit and seed, and the meaning of 'homology' with regard to modifications of these.

(3) The work of the root, stem, leaf and flower, including the main facts concerning the absorption of food and water, transpiration, respiration, metabolism, the storage of food reserves, growth, reaction to light and gravity, pollination, fertilization, and the germination of seeds. Candidates will be expected to show that they have studied these experimentally in living plants either personally or in class demonstration.

(4) The nature, occurrence and function of epidermis, roothairs, stomata, parenchyma, vascular bundles, sieve-tubes, fibres, vessels and cambium, so far as is required to understand the physiology in paragraph 3.

(5) The principal characteristics of the following orders and tribes as exemplified in South India:—

Anonaceæ, Malvaceæ, Rhamneæ, Papilionaceæ, Cæsalpinieæ, Mimoseæ, Myrtaceæ, Rubiaceæ, Compositæ, Convolvulaceæ Acanthaceae, Labiatæ, Euphorbiaceæ, Palmeæ, Musaceæ.

Candidates will not be examined in the use of the microscope, but it is expected that teachers will use the microscope freely for purposes of demonstration.

Books for Reference—

Thoday: Botany for Senior Students (Cambridge University Press).

P. F. Fyson: Botany for India.

K. Rangachari: Manual of Elementary Botany for India.

K. Rangachari: A handbook of Botany for India.

Dickson: Practical Plant Biology.

Transley, A. G.: Elementary Biology.

Gager: Fundamentals of Botany.

(ii) Zoology.

1. *Intermediate—Zoology and Physiology—*

The chief characters of living organisms. Protoplasm. Cell. Plants and Animals, how they agree and how they differ. Meaning of the terms Biology, Morphology and Physiology. The theory of Evolution treated in an elementary manner. The structure of the following animals treated in a very elementary manner with special reference to their physiology—Amœba, Paramaecium, Obelia, Earthworm. Outline of their reproduction. A more detailed study of the external characters, and of the general arrangement and relations of the chief internal organs, as revealed by dissection, in the cockroach, the frog and the rabbit. General outline of their life history. External features of a fish e.g., shark (carcharias). Life history of a butterfly. All the types mentioned above are to be studied with special reference to their environment.

The Human skeleton and its parts. The arrangement of the chief viscera in man. The leading facts of human physiology treated in a very elementary way. The nature of food and the manner in which it is digested and absorbed. Glands. The work of the liver. The nature and functions of the blood. The heart and the circulation. Respiration. Waste products and

their removal. The temperature of the body and how it is maintained. The action of muscles. The chief functions of the central nervous system, nerves and sensory organs.

Candidates will be expected to be able to make simple diagrams to show the arrangement on general features of the chief organs and structures in the animals enumerated in the syllabus. A practical knowledge of minute structure requiring the use of the microscope will not be required.

Books for Study—

G. C. Bourne: Comparative Anatomy of Animals, two volumes. (G. Bell & Sons).

Huxley (revised by Barcroft): Lessons in Elementary Physiology.

Bainbridge and Menzies; Essentials of Physiology (Longmans, Green & Co.).

Parker and Bhatia: An Elementary Text-book of Zoology for Indian Students. (Macmillan).

Introduction to Zoology—Hegner, (Macmillan & Co., New York.)

Zoology for Medical Students by Borradaile.

Elementary Physiology by Foster and Shore.

Essentials of Zoology : A. Meek (Longmans.)

Reference.—

The Text-book in Zoology by H. G. Walls and A. M. Davies.

(5) GEOGRAPHY.

I. *The Physical basis of Geography*—A general treatment of the following topics:—

(*a*) The atmosphere—chief movements of air and water and the resulting types of weather and climate including under this insolation and temperature—atmospheric pressure and world winds—precipitation—storms—local winds.

(*b*) The oceans—area and depth—continental shelf and slopes—deeps—composition of sea water—origin of salt and distribution of salinity—temperature—movement of the ocean waves and tides—currents—deposits—on the ocean floor—coral reefs and islands.

(*c*) The land—materials of the earth's crust and the forces that shape it—agencies of disintegration and reconstruction—process of earth sculpture—rivers and the development of river system—underground water—snow and ice—wind as an agent of transport and deposition—volcanoes—lakes—shore lines—deltas and estuaries.

II. *General Regional Geography on a World Basis.*—

Structure—climate—vegetation—a study of the major natural regions with reference to prevailing economic conditions—plant and animal life—distribution of population—localisation of industry—transport—trade centres and routes.

III. *Detailed Study of Eurasia*

Structural features and relief—climate—vegetation—communications and population of Eurasia as a whole and the characteristic geographical features of the S.W. Highlands of Asia. The monsoon regions—mid-Asian deserts—tundra, forests lands and steppe lands of Eurasia—the British Isles—the central plains of Europe—the central highlands of Europe—the Mediterranean region.

IV. *Practical Work.*

(*a*) Shape of the earth—determination of position—angular measurement and latitude—parallels and meridians—Greenwich time and Indian standard time—a study of the simple types of map projection.

(*b*) Study and interpretation of Indian ordnance-maps—methods of showing relief.

(*c*) Principles of field mapping by plane table, prismatic compass, clinometer—the use of a levelling staff—and aneroid barometer in determining height.

(*d*) Collection and tabulation of data—diagrammatic and cartographic methods of expression.

The following text-books are recommended to indicate the standard of work required.

General and Regional Geography—Unstead and Taylor (George Philip & Son).

Regional Geography Book IV—The World—L. Brooks (University of London Press).

The Indian Empire—Dudley Stamp (Longmans & Co.)

Text-book of Geography—A. W. Andrews (Edward Arnold & Co.)

Economic Geography of the British Empire—C. B. Thurston (University of London Press.)

A Geography of Asia—J. Martin (Macmillan & Co.)

A Geography of Europe—T. A. Smith (Macmillan & Co.)

Physiographical Introduction—A. J. Herbertson (Oxford University Press.)

Physical Geography—P. Lake (Cambridge University Press—can be obtained from Messrs. Macmillan & Co.)

Maps and Survey—A. R. Hinks (Cambridge University Press.)

A little book of map projection—W. Garnett (George Philip & Son).

Oxford Advanced Atlas (Oxford University Press).

(6) LOGIC

Creighton's Introductory Logic, Parts I and II. (Omitting Chapter 2).

(7) ANCIENT HISTORY.

PART III—GROUP (B)

The following books are recommended as indicating the scope in Greek and Roman History—

I. (1) Bury's History of Greece.

(2) History of Greece, Tutorial series.

II. (1) History of Rome—Tutorial Series.

(2) Shuckburgh's History of Rome.

(3) Pelham's History of Rome.

N.B.—In regard to the two works, Bury's History of Greece and Shuckburgh's History of Rome, the bigger books are intended.

(8) MODERN HISTORY.

General Outlines of Political, Constitutional and Industrial History, the scope being indicated by Mowat's History of England, (Oxford University Press), and Ramsay Muir's History of England, (Longmans, Green & Co.).

Reference—

Trevalyan's History of England.

Note:—The first paper shall deal with the History of Great Britain and Ireland, political, economic and constitutional down to 1603 and the second paper shall deal with the period after 1603 down to the present day.

(9) INDIAN HISTORY *

General Outlines of Indian History, the scope being indicated by Messrs. Longmans' Series of three books:—(1) Hindu India by Mr. K. V. Rangaswami Ayyangar, (2) Muhammadan

*The first paper shall deal with Ancient and Mediæval Indian History down to 1526 A.D., and the second paper shall deal with Indian History from 1526 A.D., to the present day.

India by Messrs. H. L. O. Garrett and Sitaram Kohli, and (3) British India by Mr. Rushbrook Williams.

(10) AGRICULTURE.

Theoretical.—(2 hours a week for 2 years, each year consisting of 32 working weeks—total 128 hours).

Weather.—Climate, seasons, monsoons and rainfall, as affecting the growth of crops.

Soils.—Origin. Formation. Soils of the Madras Presidency. The proximate constituents, sand, clay, lime and humus. Fertility of the soil as modified by its physical, chemical and biological properties. Water capacity and movement of water in soils. Drainage. Dormant and available plantfood. Retentive power of soils for manurial constituents.

Land Measurement—Measurement of land. Laying out of plots. Calculation of areas.

Tillage and Tillage Implements.—Necessity for and effects of Tilth, tillage. Tilth, tillage operations in wet and dry lands. Ploughs and ploughing. Wooden and iron ploughs. The parts of a plough and general adjustments. Harrows. Guntakas. Cultivators. Rollers. Tools employed in tillage operations.

Seeds and Sowing—Preparation of land for sowing. Deep and shallow sowing. Broad-casting and drilling. Implements used. Preparation of seed for sowing. Quantity and quality of seed. Selection of seed and seed strains. Germination of seed. Seed-beds. Nurseries. Transplanting.

Plant Life—Plant nutrition as illustrated by the growth of farm crops. Functions of roots, stems, leaves, flowers and seeds. Reproduction from seeds and by vegetative growth. Weeds and their distribution in land. Eradication of weeds. Interculturing. Implements and tools used.

Irrigation—Necessity for water. Sources of water supply. Laying out irrigation channels in the field. Water-lifts.

Manures and Manuring—Necessity for manures. General principles governing the application of manures. Classification of manures. Farm manures, their collection and preservation. Synthetic Farm Yard Manure. Green manuring, oil-cakes, bonemeal, fish manure. Concentrated and special manures available in South India. Unit values of manures.

Harvesting—harvesting, threshing, cleaning and measuring or weighing of produce. Storage of produce. Marketing.

Crops and Cropping—Rotations and mixed cropping. The chief Cereal, Pulse, Industrial, Fodder, and Garden crops of the Presidency, for instance, the following:—Paddy, cholam, ragi, cumbu, dholl, Bengal gram, sugarcane, cotton, groundnut, castor,

gingelly, plantain, tobacco, chillies, gogu, indigo, fodder-cholam sunnhemp, sweet-potatoes, brinjals and gourds. Other crops peculiar to the locality.

(A practical working knowledge of the crops is required deduced, as far as possible, from the students having taken part in all field operations including the preparation of the land, sowing and planting, manuring, irrigating, weeding, harvesting, threshing, and preparation for the market).

Damages caused to crops by insect pests and fungoid diseases. Control measures.

Farm Animals and Feeding.—Care and management of cattle. Breeds of cattle. Breeding. Points of a good animal. Common ailments and First-aid treatment. Cattle-foods—roughages and concentrates. Rations for growing animals, working cattle and milch cows. Milk and its general properties.

(*Practical*:—3 hours in the morning, once a week, for 2 years, each year consisting of 32 working weeks—total 64 classes).

Each student should take part in all operations going on in the farm—not merely seeing the work done by coolies—maintain a field book of observations, corrected and testified by the class teacher and the Principal as student's own work. Field books should be produced at the time of the Practical Examination. Not less than 75 per cent. of practical classes should have been attended by each student.

Examination—The examination will be both written and practical. The paper to be of 2 hour's duration and to carry 50 marks.

The practical to be of 3 hours' duration, to consist of ploughing and other field operations as well as an oral examination and to carry 50 marks.

The minimum for a pass may be the same as for other optional subjects, *i.e.*, 35 per cent.

(11) ELECTRICAL ENGINEERING.

AN ELEMENTARY COURSE IN MECHANICAL ENGINEERING.

Graphics: Problems relating to the reduction of a system of forces in two dimensions. Graphical arithmetic. Plotting of curves from given data.

Machine Drawing: Ability to copy accurately to scale and supply additional views. The preparation of drawings of simple machines from dimensioned sketches, models or actual parts of machines.

Preliminary geometrical drawing recommended:—Projections of simple solids like prisms, pyramids, cones, cylinders in simple position on the 3 co-ordinate planes. Elementary changing of planes of projection. Simple sections.

Strength of materials: Mechanical properties of engineering materials. Stress and strain. Modulus of elasticity. Elastic limit. Ultimate strength. Factor of safety and working strength. Statics and application to simple structures. Coplanar forces. Application of graphical methods to simple frames with pin joints such as cranes, etc. Elementary study of beams. Strength and stiffness. Bending moment and shearing force. Sections in iron, steel and wood. Simple shear and torsion. Horse power transmitted by solid circular shafts by assumption of formula. Principle of work. Potential and kinetic energy. Horse power. Centrifugal force and its application to governors.

Materials: Characteristics of cast iron, wrought iron and steel. Working strength of these materials in compression, tension and shear. Characteristics of copper, brass, gun-metal and aluminium.

Shafting and bearings: simple forms of shafts and shaft couplings. The pin type flexible coupling. Simple types of bearings. Pedestal, ring oiled, and ball bearings. Use of belt pulleys and their velocity ratio. Use of spur and bevel wheels. Clutches and universal joints.

PRACTICAL WORK.

The following indicates broadly the scope of the practical work.

Exercises in wood-work, forging, soldering, casting, fitting wood and metal turning.

ELECTRICAL ENGINEERING.

General principles: Electro-magnetic and C. G. S. systems of units. Principles of electro-magnetic induction. Practical system of electrical units. Electro-magnets. Production of alternating currents. Commutation. Alternating e. m. f. and current R. M. S. values; Frequency, Power and Power Factor. Simple notions of Inductance, Impedence and Polyphase currents.

Measurements: The principles of construction and use of instruments ordinarily employed.

Generators: Continuous current generator (Shunt, Series and Compound); Alternators—single and three phase; Transformers single phase; their construction, principles of action and characteristics.

Motors: Continuous current motors (shunt, series and compound) their construction, principles of action, performance and uses. Simple notions about synchronous and Induction motors.

Batteries: Construction and management of Primary and Secondary batteries and their practical applications.

Distribution: Methods of distributing electric power in streets, overhead and underground mains. Calculation of conductor sizes.

Illumination: Candle power; Use of shades; Photometer.

Note.—The instruction given will in general be descriptive only. In alternating current the treatment will be by the use of graphs avoiding mathematical equations.

LABORATORY COURSE.

The following indicates broadly the scope of the practical work.

1. Simple exercises in soldering, joining and wiring.

Direct Current—

2. Experimental verification of Joule's Law.
3. Measurement of efficiency of an electric kettle.
4. Blow out current of fuses in open air and fuse holders, influence of fuse holders and increase in number of strands.
5. Practical methods of measurement of resistance.
   - (a) Drop of potential method.
   - (b) Comparison of voltage drop with drop against a known standard resistance.
   - (c) Wheatstone bridge method.
   - (d) By ohmmeter.
   - (e) Insulation resistance by megger.
6. Calibration of measuring instruments—
   - (a) Calibration of ammeter with a sub-standard instrument.
   - (b) Calibration of voltmeter against a standard cell by use of potentiometer and ratio box and against a sub-standard volt-meter.
   - (c) Calibration of voltmeter as ohmmeter.
   - (d) Calibration of a Wattmeter against sub-standard voltmeters and ammeters.
   - (e) Calibration of ampere hour and watthour meters.
7. Tracing a switchboard circuit with and without faults.
8. Measurement of power taken by lamps, fans, electric kettles, irons, stoves, etc.
9. Shunt Motor—
   - (a) Standard connections for starting up a self excited D. C. shunt wound motor with standard type starter and field rheostat.
   - (b) Reversal of a shunt wound motor.

(c) Starting shunt wound motors with separate excitation. Use of field discharge switch.

(d) Speed characteristic of shunt motor.

(e) Efficiency of shunt motor by brake test.

10. Compound wound motors (cummulative)—Speed characteristics.

11. Gererators—

(a) Open circuit characteristics of a shunt wound generator separately excited.

(b) Load characteristic of shunt type generator separately excited and self excited.

12. Motor generators—Overall efficiency of a D. C.—D. C. motor generator set.

13. Measurement of internal resistance of a primary and a secondary cell.

Alternating Current—

14. Measurement of inductance from applied A. C. voltage, current flowing and from frequency.

15. Measurement of impedence from voltage current and frequency. Resistance and reactance components by right angled triangle construction.

16. Alternators.

(a) Open circuit characteristic of a three phase alternator.

(b) Load characteristic of a 3 phase alternator with balanced load.

17. Transformers—Single phase transformers—

(a) Ratio of transformation.

(b) Load characteristic of a transformer with non-inductive load.

(c) Efficiency by actual loading by measuring input and output by wattmeters.

18. Measurement of power.

(a) By wattmeter in a single phase circuit.

(b) In a 3 phase balanced load circuit by measuring power in one phase by a single wattmeter and multiplying by 3. Power output of a 3 phase star connected generator on balanced load.

19. Measurement of power factor.

(a) Single phase circuit.

(b) Alternator 3 phase star connected balanced load circuit by assumption of formula.

$$\text{Cos} = \frac{\text{Watts}}{\text{Line volts} \times \text{line amps} \times \sqrt{3}}$$

20. Induction motor. Squirrel cage type. 3 phase.

(a) Speed variation on load.

(b) Efficiency from brake test.

21. Calibration of an A.C. single phase watthour meter with a standard wattmeter and standard clocks.

22. Photometry—Measurement of candle power of an incandescent lamp against any standard.

Note.—At least 2 hours a week should be devoted to practical work.

(12) MECHANICAL ENGINEERING.

Graphics: Problems relating to the reduction of a system of forces in two dimensions. Plotting of curves from given data. Graphical arithmetic.

Machine drawing: Ability to copy accurately to scale and supply additional views. The preparation of drawings of simple machines and parts from dimensioned sketches, models or actual parts of machinery.

Geometrical Drawing: Projection of simple solids like prisms, pyramids, cones, and cylinders in simple positions on to the 3 co-ordinate planes. Elementary changing of the planes of projection. Simple sections.

Strength of materials: Mechanical properties of engineering materials. Stress and strain, Modulus of elasticity. Elastic limit. Ultimate strength, Factor of safety and working strength. Statics and application to simple structures. Coplanar forces. Application of graphical method to simple frames with pin joints. Elementary study of beams. Strength and stiffness, bending moments and shearing force. Sections in iron, steel and wood. Simple shear and torsion. H. P. transmitted by solid circular shafts by assumption of formula. Principle of work. Potential and kinetic energy. Horse Power. Centrifugal force and application to governors.

Heat Engines: Heat and work. Properties of steam. Sensible heat. Latent heat and total heat. Dry, saturated and superheated steam. Boiling point of liquids. Relation between temperature and pressure of steam. Laws of perfect gases. Estimation of mean pressure and work done from indicator diagrams. Brake horse power. Mechanical efficiency of engines.

Steam engines: Stationary steam engines, condensing and non-condensing, the locomotive engine; the de Laval turbine; description and working. Mechanical efficiency.

Internal combustion engines: Modern engine cycles and their applications. A simple type of 4 stroke oil engine and a two stroke oil engine.

Boiler: Description and working of common types and their accessories.

Materials: Characteristics of cast iron, wrought iron and steel. Working strength of these materials in compression, tension and shear. Characteristics of copper, brass, gun-metal and aluminium.

Connections: Forms and proportions of rivets and their arrangements in lap and butt joints—single and double riveted joints. Pitch of rivets. Forms and proportions of bolts, nuts and keys.

Shaftings and bearings: Simple forms of shaft couplings and shaft bearings. Clutches; claw and simple cone friction types. Arrangement of pedestal and footstep bearings. Simple types of ball bearings. Methods of lubricating bearings.

Belt and toothed gearing: Forms of belt pulleys; Velocity ratio. Fast and loose pulleys. Stepped speed cones. Tension of belts, Joints of belts. Materials of belting. Spur and bevel wheels and their velocity ratio.

Engine details: Usual forms of cranks and levers, eccentrics, connecting rods, cross heads and coupling rods.

Pumps: Working of simple types.

Note:—*Instruction will in general be descriptive only.*

PRACTICAL WORK.

The following indicates broadly the scope of the practical work.

1. Simple lessons in woodwork, forging, soldering, casting, fitting, wood and metal turning.

2. Verification of Hooke's Law for tension. Determination of Elastic limit and Young's Modulus.

3. Verification of laws of strength and stiffness of beams.

4. Determination of the mechanical equivalent of heat.

5. Determination of latent heat.

6. Determination of the relation between temperature and pressure of steam.

7. Determination of I. H. P. from diagram supplied.

8. Brake Horse Power of an engine.

Note.—At least two hours a week to be given to practical work.

(13) SURVEYING.

Chain, Prismatic Compass and Plane Table—Running a chain line; measuring offsets; use of the cross staff; optical square; survey of areas with chain only; well conditioned triangles, check or tie lines; keeping the field book: testing the chain; modes of passing obstacles; chaining across a river or other obstacle; survey of areas with prismatic compass; keeping the field book; plotting surveys made with chain and compass; survey of areas with plane tables; inaccessible points; filling in a survey; finding one's place in a survey.

Setting out.—Ranging straight lines by eye. Laying out curves by chords and offsets.

Level.—Permanent and temporary adjustments; levelling field book, two methods of reducing the field book; levelling: contouring; cross section; correction for curvature of the earth and refraction; check levels; bench marks; use of Abney's level; clinometer and ghaut tracer; setting out gradient for railways, canals and sewers.

Theodolite.—Use and adjustments of Theodolites; travers ing; Gales' system; setting out straight lines and curves.

Drawing and Mensuration.—Use of drawing instruments, construction of scales; conventional signs; estimation of areas; use of Planimeter and Pantagraph; plotting lines of levels and taking out quantites of earth-work; copying plans to different scales by squares; representation of ground by contours; section on contoured plans; location of roads and railways on contoured plans showing cuttings and embankments; estimation of areas and volumes; reduction and plotting of a theodolite traverse.

Surveying.—Four hours per week for two years will be adequate for covering the syllabus. One hour each week may be devoted to lecturing and 3 hours for outdoor practice. For every 12 students, one set of instruments may be provided.

Text-books—To indicate the scope and standard the following text-books are suggested for the present :—

Electrical Engineering—Mechanical Engineering.

Applied Mechanics—Cryer and Jordan.

Machine Design—Frank Castle.

Mechanics for Engineers—Morley (advanced portions to be omitted.)

Steam (Elementary)—Ripper.

Steam Engines—Holmes.

Electrical Engineering—Principles of Direct Current Electrical Engineering—Barr.

Electrical Engineering—Gray.

Surveying.

Methods of Surveying by N. F. Mackenzie.

(14) ARCHITECTURE.

1. General Survey and History of Architecture:—

   Egyptian, Greek, Roman, Byzantine, Gothic, Indian, Eastern, Modern.

2. Materials of Construction, and limitations imposed by them—Wood, stone, brick, concrete, terra cotta, steel, mortars.

3. Styles of Architecture:—Main points of difference and evolution.

4. Indian styles and their chief characteristics.—Cave Architecture, Jain, Buddhist, Dravidian, Pallava, Chalukyan, Vijianagar, Saracenic, combinations of styles.

5. General principles of designs:—Temple architecture, Architecture of Public Buildings. Indian Domestic Architecture—Huts, Contiguous houses with court-yard, bungalow or garden houses, palaces. Influence of climate, rainfall, geographical position, etc.

6. Details and Ornamentation—Orders, Pillars, Bases and Capitals, Doors and Windows, Friezes, Mouldings, Ceilings, Roofs, Facades, Floors.

7. Drawing—Geometrical Drawing, Figure Drawings, perspective, making sketches from objects, shading.

Note.—There shall be two papers of two hours duration each.

DRAWING.

Time available: 4 hours per week for 2 years (20 months).

The course shall consist of two branches—

A. Practical Drawing and Painting.

B. History, Theory and Appreciation of Art.

A. i Still Life.

ii Objects in relief for appreciation of light and shade.

iii. The Human figure in repose.

iv. The Human figure in action.

The examination will be of 5 hours—i. Still life in colour; ii. Object in relief, etc., monochrome; The human figure in (iii) repose and (iv) action, both in monochrome.

B. i. The laws of perspective.

ii. History of (*a*) Indian and (*b*) European art.

iii. Theory and appreciation of Art, with special reference to

(a) Aganta Frescoes, Mogul Art and Modern Indian Art.

(b) Italian, Dutch and Modern European Schools up to the end of the XIX century.

This course requires the study of a large number of reproductions (in colour) of pictures.

Note.—There shall be two examinations, one a written examination of 2 hours, and the other a practical examination.

(15) INDIAN MUSIC.

Theory of Music.

(1) Theory—musical sounds and intervals, including laws of vibrations of strings and air columns. Harmonics and upper partial tones. Pitch, Intensity, Timbre and Voice Registers (Sthayi). Swaras 7 and 12, and their names. Consonant and Dissonant Notes—Vadi, Vivadi and Samvadi.

(2) **Raga and Tala.**

Definition of Raga.

Raga classifications in Carnatic Music.

Definition of Tala.

The Tala system of Carnatic Music. The Theory of 35 Talas.

(3) *Musical Composition.*—The characteristics of different types of musical compositions, *viz.*, Gitas, Varnas, Ragamalikas, Kirtanams, Padams, Chindus.

Principles of Carnatic Notation (Sa, ri, ga, ma, etc.).

(4) *History of South Indian Music.*—Biographies of the following South Indian Musicians and Composers and their contribution to Carnatic Music.

Venkatamakhi, Kshetrajnulu, Muthuswami Dikshitar, Tyagaraja, Syama Sastri, Pattanam Subrahmanya Ayyar, Arunachala Kavirayar and Gopala Krishna Bharati.

(5) (*a*) A knowledge of the following 15 ragas and of at least one musical composition in each: Todi, Bhairavi, Sankarabharanam, Kalyani, Kambhoji, Saveri, Mohanam, Mukhari, Kedaragaulam, Arabhi, Sriragam, Bilahari, Yadukulakambhoji, Ananda Bhairavi and Nadanamakriya.

(*b*) A knowledge of one raga out of each of the following five groups of four ragas each:—

1. Kharaharapriya, Sriranjani, Ritigaula and Abheri.
2. Atana, Kedaram, Begada and Hamsadhvani.
3. Sahana, Natakuranji, Harikambhoji and Kuntalavarali.
4. Pantuvarali, Purikalyani, Ramapriya and Saranga.
5. Chakravakam, Asaveri, Vasanta and Dhanyasi.

There shall be one theory paper of 3 hours' duration (60 marks) and a practical examination—(40 marks.)

There shall be a practical examination in either vocal or instrumental music and a separate minimum of 30 per cent, will be required in the practical examination. As regards instrumental music, candidates will have the choice of playing on any of the following instruments: Veena, Violin and Flute.

In the practical examination, candidates will be expected to sing or play any of the 20 ragas prescribed as well as compositions in any one of the following Talas:—

Adi, Rupaka, Triputa and Chapu.

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Books for Reference—

1. Sangita Sampradaya Pradarsini, by Subbarama Dikshitar—Two Volumes and the Primer.
2. Oriental Music in European Notation—by A. M. Chinnaswami Mudaliyar.
3. Music of India by Rev. H. A. Popley.
4. Music of Hindusthan by A. H. Fox—Strangways.
5. Richardson—"Sound"
6. T. S. Krishnaswami—"Sound."
7. Modern Violin Technique by Thistleton.
8. "Thiagaraja" by M. S. Ramaswami Ayyar.
9. Singaracharlu's Musical Publications in seven parts.
10. "Thyagaraja Hrudayam"—3 Volumes—by K. V. Srinivasa Ayyangar.
11. Bharata Sangita Swayambhodini by T. C. R. Johannes.
12. "Sound" by Nightingale (Bell & Sons).
13. The Melakarta Janyaraga Scheme—by P. Sambamurti. (The Indian Music Publishing House, G. T., Madras.).

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The same as for 1932 with the addition of the following:—

1. Swaramanjari.
2. Gayaka Parijatam.
3. Sangita Kalanidhi.
4. Gayaka Siddhanjanam, Parts I & II.

(Nos. 1–4) By T. Singaracharlu.

5. Sangita Chintamani by K. V. Srinivasa Ayyangar.
6. Sangita Sudhambudhi by K. V. Srinivasa Ayyangar.

(16) WESTERN MUSIC.

I. Theory

1. *Notation.*—The Staff and clefs; Leger Lines; Accidentals; Formation of the Major and Minor Scales (both forms of the latter) and Chromatic Scales Key-signatures and Time-signatures.

2. *Time.*—Relative duration of sounds; Notes; Rests; Dots; Ties, Staccato-marks; the Pause; Regular and Irregular Grouping of notes; Syncopation; Adding Time-Singature and Bar-lines to a given Melody; Completing a Bar by the addition of Rests or Notes.

3. *Transposition and Terms.*—Transposition of a simple example from Clef to Clef (G. C. and F), from Key to Key and from Short to Open Score, or *vice versa.* Knowledge of necessary Terms for the writing of Chords, and for Part-writing. Naming the key of a given passage and supplying the Key-signature.

4. *Intervals.*—Diatonic and Chromatic, simple and compound, direct and inverted. Figuring the Bass of a simple example of Harmony up to and including Chords of the 7th and their Inversions.

5. *Harmony.*—Simple exercises on Triads and their Inversions, the Dominant 7th and its Inversions and Resolutions. The construction and designation of Cadences.

6. *Melodic Analysis.*—The Analysis of a simple eight-bar Melodic sentence into "fore" and "after" phrases and sections.

7. Terms and signs in general use, Ornaments and Embellishments.

Text-Books.—

i. Rudiments of Music—Stewart Macpherson—(Associated Board Publication).

ii. Rudiments of Music—W. H. Cummings. (Novello's Music Primers).

iii. Text-book of Musical Knowledge (Upper Division)—C. W. Pearce, Trinity Coll: Publication).

iv. Harmony—J. Stainer (Novello's Music Primers).

II. Viva Voce and Ear Tests.

1. Rhythm and Time. To hum or tap a rhythmical passage played on the Pianforte by the Examiner and to state the Time.

2. To recognise Major and Minor common chords and their Inversions played in four-part Harmony.

3. To recognise Cadences.

4. To name five notes of a Diatonic Major scale played in any order.

5. To name five notes of a Diatonic Minor scale played in any order.

6. To answer questions on—

(i) Scales, Major and Minor (both forms),

(ii) Intervals,

(iii) Accent,

(iv) On Marks of Expression.

III. Practical Examination.

1. Scales—Major and Minor (Melodic and Harmonic) in all Keys-compass two octaves.

2. Arpeggios—formed of all the Major and Minor common chords in all Keys—compass two octaves.

3. Two Studies (to be prescribed from year to year).

4. Two Pieces (to be prescribed from year to year).

Books: Music Publications of Local Examinations in Music of—

i. The Trinity College, London.

ii. The Associated Board of the Royal Academy of Music and the Royal College of Music, London.

Two hours each week may be devoted to Theory, and two hours for Practice.

There shall be one theory paper of three hours' duration and a practical examination and *viva voce* and Ear Tests.

(17) COMMERCE

Elements of Commerce.

Commerce: Evolution of modern commerce. The Economic basis of Commerce. Industry: Evolution of modern industry; Commerce in relation to industry.

Industrial and Business Organisation: Types of businesses: Individualistic concerns, Partnerships, Joint Stock Companies—Public and Private, Trusts and monopolies, Co-operative undertakings, Government and Municipal undertakings.

Organisation of Capital. Organisation of Labour. Organisation of credit. Banking. Organisation of trade. Agency business. Managing Agents. Marketing and Salesmanship. Produce exchanges. Advertising.

Land, water and air transport. Shipping and railway formalities. Insurance (Fire and Marine). War-housing. Documents used in the above.

Office organisation: accounting. Correspondence. Filing, Indexing. Statistical records of business results.

Chamber of commerce and other institutions for the promotion of trade. Trade barriers, Customs and customs formalities.

Methods of payment. Balance of trade and its liquidation. Foreign exchange. Currencies of leading commercial countries and their conversion.

Books recommended—

Stephenson: Principles and Practice of Commerce.

ACCOUNTANCY.

1. Book-keeping: its principles and practice by means of double entry. The uses of subsidiary books. Accounts of trading and non-trading concerns. Preparation of annual accounts, manufacturing, trading and profit and loss accounts and balance-sheet; real, personal and nominal accounts. Goodwill. Depreciation. Reserves. Reserve fund. Sinking funds.

2. Capital and revenue accounts. Receipts and payments accounts. Income and expenditure accounts.

3. Departmental and Branch accounts including Foreign Branches. Consignment and Joint adventures.

4. Partnership accounts including dissolution of partnerships and questions of good-will. Adjustment of accounts as between partners.

5. Joint Stock companies accounts. Statutory books and returns. Share capital and share records. Issue of shares. Allotments and calls. Debentures. Premium and discount on shares and debentures. Reduction of capital and reconstruction. Purchase of business. Reconstruction, amalgamation and absorption.

6. Systems of accounting as applied to commercial enterprises; public undertakings; charities; hospitals, etc.

7. Single entry; its conversion into Double-Entry.

Books recommended—

Arthur Fieldhouse: Complete Commercial Book-keeping.

(18) ECONOMIC GEOGRAPHY.

1. General World Geography.

Physical basis of **Geography. Structure** and soil-Relief and drainage-climate and rainfall-natural vegetation-major natural regions of the world-population, its distribution and density.

2. Chief world commodities—their distribution and conditions of production, relative supply and markets. Food stuffs of animal and vegetable origin-mineral products—raw materials of industry.

3. Chief world industries and their regional distribution, special attention being paid to textile, iron and steel, ship-building and chemical industries—sources of mechanical power.

4. Transport-inland and oceanic-relation to hinterlands and markets-world ports and trade routes-immigration and colonisation.

Text-books—

1. Dudley Stamp—Intermediate Commercial Geography, (Longmans).

2. Macfarlane—Economic Geography.

ECONOMIC HISTORY.

A general survey of industrial and commercial developments in Great Britain.

1. The natural and human foundations of Britain's economic pre-eminence—The manorial system and mediaeval agricultural conditions. Guilds and handicrafts—Mediaeval trade—Breakdown of mediaeval economy—Enclosures and social changes—Rise of national unity, the mercantile system—English industries in 1700—The influence of foreign immigrants.—The East India Company and its economic influence on England.

2. The Industrial Revolution and its social and economic effects—Rise of cotton and iron industries—Agricultural Reform and agrarian changes—New transport methods—Steamship and Railway. Commercial Revolution. Poor relief, factory reform and public health legislation—Tariff policy—Growth of Banking—Labour movement. Commercial Revolution. Decay of English agriculture and efforts at its resuscitation—Growth of State regulation—Economic effects of the World War.

Text-books—

1. Sir W. Ashley—The Economic Organisation of England.

2. M. D. Stocks—The Industrial State.

For reference only—

Lipson : The Economic History of England—Middle Ages ; and

Knowles : The Industrial and Commercial Revolutions in Great Britain during the 19th Century.

INTERMEDIATE EXAMINATION IN ARTS AND SCIENCE

(b) Text-books.

ENGLISH.

1931

PART I.

Shakespeare: *Twelfth Night*—

Poetry—

M. Baring: *In Memoriam, A. H.* (200).

J. Grenfell: *Into Battle.* (46).

Lord Byron: *Waterloo.* (64).

W. W. Gibson: *Flannan Isle.* (110).

R. Kipling: *Recessional.* (30).

Milton: *Il Penseroso.* (180).

Shakespeare: "Full many a glorious morning have I seen."

Wordsworth: "The world is too much with us."

J. C. Squire: "There was an Indian, who had known no change."

Milton: "On his blindness"—published in a Book of English Poems by J. H. Jagger, M.A., D.Litt., Part IV, University of London Press, Ltd., Longman's Green & Co.

Prose—

For Detailed Study—

1. A shorter Boswell: Edited by John Bailey, Thomas Nelson & Sons.

2. Essays and Essayists: Edited by Henry Newbolt, Nelson & Sons.

The selections from Steele, Addison, Goldsmith, Lamb, Stevenson, Mary Coleridge, Hilaire Belloc and Edward Thomas.

For Non-detailed Study—

Historical Tales from Shakespeare by A. T. Quiller Couch, Edward Arnold & Co.

Dickens—A Tale of Two Cities. Edited by C. H. Russell, Macmillan & Co.

SANSKRIT.

1931.

PARTS II & III-B.

1. Kālidāsa—Mālavikāgnimitra, (Nirnayasagara Press, Bombay.)
2. Kālidāsa—Kumāra-sambhava, first three Cantos only. (Nirnayasagara Press, Bombay.)
3. Harsa-carita-samgraha (Ucchvāsas 3, 4, 5 and 6) by Pandit R. V. Krishnamachariyar. (To be had of the Author, Government College, Kumbakonam.)

MARATHI.

1931.

PARTS II & III-B.

For Non-Detailed Study—

1. Justice Ranade's Religious Essays, Pages 1—218.
2. Life of Socrates by Krishna Shastri, Chiplunkar.

Two hours Paper for Detailed Study—

1. Navanita: All extracts of Moropant.
2. Shakuntala by Laxman Shastri Lele.
3. Life of Sri Jnaneshwar by B. K. Parakh.
4. Marathi *ani* Ingraja by N. C. Kelkar.

N.B.—All the above books can be had from Messrs. Parachure Puranick and Co., "Madhava Bagh", Bombay, or New Kitab Khana, Poona City.

ORIYA.

1931.

PART II.

For Non-detailed Study—

Jalayātra by Virupāksa Kar.

Bāravâtee Durga by Kṛpasindhu Misra.

Two hours paper for Detailed Study—

Poetry—

Tapaswini by G. Meher.

Prose—

Bayi Mahānty Pānjee by Gopalachandra Praharaj.

Kṛsna Katha, pages 53—71, by Upendranath Pradhan.

Drama—

Vikramorvashee by Mṛtyunjaya Rath.

PART III-B.

1. Bhuvaneswara by Chintāmoni Āchārya.
2. Pravandhapāth by Mrutyunjaya Rath.
3. Indumati by G. Meher.

All the above books can be had from "The Mukur Press, Cuttack" or from "The Trading Company, Cuttack" or from "The Students' Stores, Berhampur (Ganjam District)."

HINDI.

1931.

PARTS II & III-B.

For Non-Detailed Study—

Kadambari by Gadadhar Sinha, published by Indian Press, Ltd., Allahabad.

Sapta Saroj (omitting Upadesh) by Premchand, published by Hindi Pustak Agency, Harrison Road, Calcutta.

For Detailed Study—

Prose—

Guru Nanak (Ganga Pustakmala Karyalaya, Aminabad Park, Lucknow).

Poetry—

Praveshika Padyavali—Part I, pages 51-82, published by Indian Press, Ltd., Allahabad.

Van-Vaibhav by Maithlisharan Gupta, published by Sahitya Sadan, Chirgaon, Jhansi, United Provinces.

LATIN.

1931.

PARTS II & III-B.

Virgil: Aeneid VI.
Cicero: Speeches against Catiline, I—IV.
Livy: History, XXII.

FRENCH.

1931.

PARTS II & III-B.

Racine: Britannicus (first three Acts only).

Molière: L' Avare.

Feuillet: Le Roman d'un Jeune Homme Pauvre.

Selections by A. Watson Bain (Macmillan), 20 Sonnets. Nos. 101—120.

GERMAN.

1931.

PARTS II & III-B.

Schiller, Wilhelm Tell.

Deutsche Erzählende Prosa, Zweites Brandchen, (Deutsche Prosa, IV Teil), published by Velhagen and Khlasing, Bielefeld and Leipzig.

A Book of German Verse edited with Introduction, etc., by H. G. Fiedler, for use in schools and colleges, published by the Clarendon Press, Oxford. (Nos. 92—104 inclusive).

W. Hauff, Das Wirtshaus im Spessart (Selection). Introduction and Das Kalte Herz (pp. 1—7, 31—56, 136—156, in Macmillans' edition).

ARABIC.

1931.

PART II.

Màjàni'ul Adab, Volume I.

Addrúsun Nahvyyah, Volumes I and II.

PART III-B.

Nukhabul Mulah, Part IV.

Diwán, Abul 'Atāhiyah, Alif and Ba.

PERSIAN.

1931.

PART II.

Fársí-i-Jadíd, Parts II and III.

Dastúri-Fársí, Part II.

PART III-B.

Siyásat Nameh, First 120 pages.

Ahmad Khan and Azizah.

Lu'ali-i-Manzumah.

URDU.

1931.

PART II.

Matriculation Nisábi Urdu (Oosmaniah University).

Intikhábi-Mazamin-i-Sir Sayyid.

Asás-i-Urdu.

PART III-B.

Taubatun-Nasúh.

Diwan-i-Halí (Qit'át, Ghazaliyyat, and Ruba'iyyát).

Prem Battisi by Prem Chand, Part I.

HEBREW.

1931.

PARTS II AND III-B.

1st Kings
Ruth, the whole book.

TAMIL.

1931.

PART II.

Detailed (2 *hours paper*)—

***Poetry*—**

(Selections published by the University.)

Kural (குறள்) Chaps. 9, 10, 11, 12 and 13.

Cilappadikaram—Venba (சிலப்பதிகாரம்—வெண்பாக்கள்).

Kambaramayanam—Thiruvadi Tholudapadalam (கம்பராமாயணம்—திருவடி தொழுதபடலம்) 45 stanzas.

Vinayagar Pillaittamil-(விநாயகர் பிள்ளைத்தமிழ்) 10 stanzas.

Karuvai Paditruppattandadi (கருவைப் பதிற்றுப்பத்தந்தாதி) 50 stanzas.

Puviyelupathu (புவியெழுபது)-by Mr. R. Raghava Ayyangar, 70 Stanzas.

***Prose*—**

Cheran Chenkuttuvan (சேரன் செங்குட்டுவன்)-by Mr. M. Raghava Ayyangar, Tamil Lexicon office, Limbdi Gardens, Royapattah, Madras.

Sitha Kalyanam (சீதா கலியாணம்)—by Diwan Bahadur S. Bavanandam Pillai, (Messrs. Higginbothams, Madras.)

Non-Detailed (3 ***hours paper***)—

Self-help (தன்முயற்சி)—Edited by Mr. C. R. Namasivaya Mudaliyar—Messrs. C. Coomarasawmi Naidu & Sons, Madras.

Manimekhalai (மணிமேகலை)—by Mahamahopadhyaya V. Swaminatha Ayyar, Tiruvatteswaranpet, Madras.

PART III-B.

Poetry—

1. Needinerivilakkam.	Selections published by the University.
2. Harichandrapuranam.	
3. Pattinatharpadal.	
4. Thondamandala Sathakam.	
5. Pandimandala Sathakam.	
6. Cholamandala Sathakam.	
7. Kongumandala Sathakam.	

Prose—

1. Janavinodini, (Revised edition of Part I, No. XIII), by Mr. C. R. Namasivaya Mudaliyar.
2. Dakshina Charitra Veerar, by A. Madhaviah, Mylapore, Madras.

TELUGU.

1931.

PARTS II & III-B.

Poetry—

Selections in Telugu.

27. Sanjayundu Upaplavyambuna nunna Pandavula Yoddaku Vacchuta, 123 verses.

52. Parvati Tapasu, 34 verses.

Selections from Manibhushanamu II, by T. Rajagopala Rao Garu:—

1. Sree Krishnuni Bala Kridalu—Selection No. 5.
2. Ambarishopakhyanamu—Selection No. 6.
3. Kuchalopakhyanamu—Selection No. 8.

Parijatapaharanamu by Mukku Timmanna, canto i, verses 33 to 137.

Modern Poetry—

Viswagunadarsamu by Ramakrishna Kavulu of Pithapuram —Suryavarnanamu to Jagannadhakshetravarnanamu—pages 5 to 30 (both inclusive), 90 verses.

Drama—

Mudra Rakshasamu by Susarla Ananta Rao, published by V. Ramaswamy Sastrulu & Sons.

Prose—

Kathasaritsagaramu, 9th Lambaka, 80 pages.

Yajurveda Kathalu by P. Sarwesvara Sastri, published by V. Ramaswami Sastrulu & Sons.

Bharata Saramu, by N. Kuppuswamiah, Chapters VII and VIII.

Non-Detailed—

Vemana by Vanguri Subba Rao, Kamalakutir, Narasapur.

Ramarayaningar Telugu Prize Essay—Vyapara sulka vidhana-samasya, by Mr. D. Lakshminarasimham, Professor, C. D. College, Anantapur.

KANARESE.

1931.

PARTS II & III-B

(i) Selections published by the University—Pages 334 to 358, (Abhinava Dasakumara Charitam—Pushpodbhava Charitam), and Pages 174 to 208 (Jayanripa Kavya).

(ii) Vikramorvasiya Nataka by Pandit S. Aiya Sastri, (M. S. Rao & Co., Avenue Road, Bangalore City).

For Non-Detailed Study—

(iii) Koti Channaiya by P. Mangesh Rao, B.A., L.T., (Bala Sahitya Mandala, Mangalore).

(iv) Jayachandra by Pandit Narasimhaiya, (M. S. Rao & Co., Bangalore City).

(v) Kadambari Kathe by Pandit G. V. Krishnachar, (M. S. Rao & Co., Bangalore City).

MALAYALAM.

1931.

PART II.

For the first paper of three hours' duration the following books are prescribed for non-detailed study for the essay:—

1. Unniramavarma by Pandit Sankara Menon, Trichur. (To be had of the Author).
2. Kundalatha by T. M. Appu Nedungadi, B.A., B.L., Calicut, (To be had of the Author).

For the second paper of two hours' duration.

Poetry—

1. Bharatham—Karnaparvam—by Ezuthachan (Any press).
2. The following pieces in Tarangini by Ullur S. Parameswara Ayyar, M.A., B.L., Trivandrum, to be had of the Author:—
   (a) Dathapaharam.
   (b) Thumbapoovu.
   (c) Balankuram.
   (d) Sukham-Sukham.
3. Vinodini of Otuvil Kunhi Krishna Menon, B.A. (Published by P. V. Krishna Varier, Kottakkal, S. Malabar).

4. Sreemanavikramavijayam by Kunhukuttan Thampuran, Published by Kozhipurath Ramunni Menon, B.A., Sub-Registrar Guruvayur; can be had also at Mangalodayam Book Depot, Trichur).

Prose—

1. Valluva Kammaran by C. Kunhi Raman Menon, (To be had at the Mangalodayam Press, Trichur).
2. Chandraguptan by K. V. M. (To be had at Jnanasagaram Book Depot, Trichur).

PART III-B.

Poetry—

1. Sishyanum Makanum by Vallathol, (Published by A. R. P. Press, Kunnamkulam, Cochin State).
2. Srikrishnacharitam Manipravalam—First two Sargams, (Any Press).

Prose—

1. Nalópakhyanam from the Bharatam (Prose) by Kunnath Janardana Menon, (Publisher—K. K. Thampan, Pulapatta, South Malabar).

Text-books for the Examinations of 1932.

ENGLISH.

PART I.

1932.

Shakespeare: Twelfth Night.

Poetry—

Selections from Chilswell Book of English Poetry :—

Milton :	L'Allegro.
Byron :	Ocean.
Wordsworth :	The Leech Gatherer.
Coleridge :	Kubla Khan.
Hodgson :	The Song of Honour.

Prose—

Detailed Study—

Newbolt: Essays and Essayists (Nelson)—the following selections :—Richard Steele, Joseph Addison, Oliver Goldsmith, Charles Lamb's *Christ's Hospital*, William Hazlitt, R. L. Stevenson, Mary Coleridge, Hilaire Belloc.

Macaulay's Essays on Johnson and Goldsmith (Encyclopaedia Brittanica Essays) in "Five Essays by Macaulay" available in Bohn's Popular Library published by Bell & Sons; and the "Massacre of Glencoe" and "The Siege of Londonderry" (Published in "Narratives from Macaulay," edited by Johnson, Macmillan & Co.)

Non-detailed Study :—

Any two of the following books:—

1. Stories of Chivalry, Part II (Blackie & Sons).
2. Dickens' "David Copperfield," (Abridged edition. Herbert Strang's Library. Oxford University Press).
3. The Book of the Long Trail (Abridged edition, Messrs. Longmans, Green & Co.)

SANSKRIT.

1932.

PARTS II & III-B.

The same as for 1931.

MARATHI.

1932.

PARTS II & III-B.

For non-detailed study.—

1. Dr. R. G. Bhandarkar's Religious Essays, pages 1—212.
2. Life of Socrates by Krishna Shastri Chiplunkar.

For detailed study.—

1. Extracts from Navanit :—

   Dnyanadeva—Selections from Dyaneswari, Chapters 12 and 13, pages 1—14.

   Moropant—Keka and Ambarishakhyana, pages 253—373.

   Raghunath Pandit—Nala Damayanti Svayamvarakhyan, pages 380—410.

   Narhari—Gangaratnamala, pages 416—436.

2. Venisamhar by Parashuram Tatya Godbole.
3. Life of Dnyaneswari by B. K. Parakh.
4. Marathi *ani* Ingraja by N. C. Kelkar, pages 1—152.

The above books can be had at New Kitab Khana, Poona City or Messrs. Parachure Puranick and Co., 'Madhava Bagh', Bombay.

ORIYA.

1932

PART II.

For detailed study.—

Poetry—

Pranayaballari by G. Meher.

Prose—

Bayi Mahanty Panjee by Gopalachandra Praharaj.

Kanakalata by Nandakisora Bai.

Drama—

Pratap Nataka by Raja of Chikati.

For non-detailed study.—

Paschatyabhramana by Raja of Surangi.

Santi Dhara by Vasudeb Mahapatro.

PART III-B.

1. Beerabharata by Vasudeb Mahapatro.
2. Prabandhapatha by Mrutyunjaya Rath.
3. Indumati by G. Meher.

The above books can be had at "The Mukur Press, Cuttack" or at "The Trading Company, Cuttack", or at the "Students' Stores, Berhampur, (Ganjam District.)"

HINDI.

1932.

PARTS II & III-B.

The same as for 1931.

LATIN.

1932.

PARTS II AND III-B.

Virgil: Aeneid IX.

Cicero: Speeches against Catiline, I—IV.

Livy: History XXII.

FRENCH.

1932.

PARTS II AND III-B.

Racine: Andromaque.

A. Watson Bain: French Poetry for advanced students, Nos. 101—120.

Feuillet: Le Roman d'un Jeune Homme Pauvre.

Modern French Prose, 1918—1928 (Ed. Nelson).

(All the above books are available at Messrs. Varadachari & Co., Lingha Chetty Street, G. T., Madras.)

GERMAN.

1932.

PARTS II AND III-B.

The same as for 1931.

ARABIC, PERSIAN AND URDU.

1932.

Arabic—

PARTS II AND III-B.

Majáni-ul-Adab—Volume I.

Qawá 'idul-Lughatil ' Arabiyyah—grammar portion only.

Persian—

PART II.

Akahláq-i-Káshifi-Edited by Ja'fari—Prose.
Muntakhabul Ash'ár. Edited by Sell—Poetry.
Jamiul—Qwa'id by Azad.

PART III-B.

Anwar-i-Suhayli—Chapters I and II-Edited by Ja'fari.
Ruq'at-i-A 'lamgiri.
Rustum-wa-Suhráb—Selections by Ja'fari.

Urdu—

PART II.

Kainat-i-Adab (Prose portion—from the beginning up to 147, Poetry—from pages 181 to 260 with the lives of the corresponding authors at the end of the book)—available at Islamiah Book Depot, Kurnool.

Tufan-i-Hayath.

The following book is recommended for grammar :—
Asas-i-Urdu.

PART III-B.

Intikhab-i-Makhzan	Part III—Prose.
Manazir-i-Qudrat	Part II—Poetry.
Prem Pachchisi	Part I—Non-detailed.

The following book is recommended for grammar :—
Asas-i-Urdu—By Ja'fari.

HEBREW.

1932

PARTS II AND III-B.

The same as for 1931.

TAMIL

1932.

PART II.

Poetry—

Selections published by the University—

Tirukkural. 5 Chapters.
திருக்குறள்

Manimakalai. சிறைக்கோட்டம் அறக்கோட்டமாக்கிய காதை
மணிமேகலை

Aranericharam. 20 Stanzas.
அறநெறிச்சாரம்

Kamba Ramayanam. Mandarai Soozchipadalam.
கம்பராமாயணம் மந்தரை சூழ்ச்சிப்படலம்

Tiruvarangathumalai. திருவரங்கத்துமாலை	20 Stanzas.	
Villiputhurar Bharatam. வில்லிபுத்தூரார் பாரதம்	Niraimeetchi Charukkam. நிறைமீட்சிச் சருக்கம்	150
Sonachalamalai. சோணசலமாலை	20 Stanzas.	
Arunai Andadi. அருணையந்தாதி	10 do.	

Prose—

Detailed Study—

Chalukya Vikramaditya—by Mr. A. V. Venkatarama Iyer.
சாளுக்கிய விக்கிரமாதித்தன்

Keechakan—by Mr. C. R. Namasivaya Mudaliar.
கீசகன்

Non-detailed study—

Murugan—by Krishnakumari (M. L. J. Press, Mylapore).
முருகன்

Pallavar, II & III—by Mr. P. T. Srinivasa Ayyangar.
பல்லவர்

PART III-B.

The same as for 1931.

TELUGU.

1932.

PART II.

Poetry—

		Verses
1.	Bharatamu : Virataparvamu : I canto—by Tikkana	... 147
2.	Parijatapaharanamu—by Mukku Timmanna, I canto	... 140
3.	Ramarajeeyamu—by Venkayya, published by Vavilla Ramaswamy Sastrulu & Sons., Verses 169-275	... 106
	Total number of verses	... 393

Modern Poetry—

Apurvasanghasamskaranamu—by Kallakuri Gopala Rau Garu, Teachers' College, Saidapet.

Drama—

Abhignana Sakuntalamu—by Kavithilaka Vidvan K. Kanakamma Garu.

Prose— Pages.

1. Baratamu. Aranyaparvamu. Dharmarajunaku Markandeyudu Dharmopadesamu Cheyuta—by Sathaghantam Venkataranga Sastrulu ... 60
2. Kathasaritsagaramu—by Vedam Venkataraya Sastry, published by Vavilla Ramaswamy Sastrulu & Sons., Part I, pages 1-100. V. Venkatarayan, Mallikeswarar Lane, G. T., Madras ... 100
3. Nayapradeepamu—Vigrahamu—by Korada Ramachandra Sastry—published by K. Ramakrishnayya Garu, O. R. Institute, Royapettah ... 50

Total number of pages ... 210

Non-detailed—

1. Adidamu Surakavi (omitting Chapter X—pages 84 to the end)—by Adidam Rama Rao, Vizianagaram.
2. Tailapa—by A. V. L. Venkateswaraiah, Akbar Sahib Street, Triplicane, Madras.

PART III-B *Verses.*

Poetry—

1. Bharatamu ; Virataparvamu ; I canto, by Tikkanna ... 147
2. Parijatapaharanamu, by Mukku Timmanna, I Canto ... 140

Total number of verses ... 287

Modern Poetry—

Apurvasanghasamskaranamu by Kallukuri Gopala Rao.

Drama—

Abhignana Sakuntalamu—by Kavithilaka Vidvan K. Kanakamma Garu.

Prose— Pages.

1. Bharatamu—Aranyaparvamu—Dharmarajunaku Markandeyudu Dharmopadesamu Cheyuta—by Sathagantam Venkatarangayya Sastrulu ... 60
2. Kathasaritsagaramu—by Vedam Venkataraya Sastry—published by Vavilla Ramaswamy Sastrulu & Sons., Part I, pages 1-100 ... 100

Total number of pages ... 160

Non-detailed—

1. Tailapa—by A. V. L. Venkateswariah Garu, Akbar Sahib Street, Triplicane, Madras.

KANARESE.

1932.

PART II AND III-B.

For detailed study :—

1. Jaimini Bharata by Lakshmisha—Chapters 28, 29, 30, and 31. The story of Chandrahasa—(Vishwa Karnataka Publishing House, Chikpet, Bangalore City).
2. Niti Manjari, Part I—by R. Narasimhachar, M. A. The 1st 50 stanzas. (The author, Malleshwaram, Bangalore).
3. Subhadra Vijaya Nataka by B. Rama Rao, M.A., LL.B., (Bala Sahitya Mandala, Mangalore.)

For non-detailed study :—

1. Champakamalini—by A. Rajammal (B. B. D. Power Press, Cottonpet, Bangalore).
2. Karnarjuna—by K. S. Karanth ("Vasantha" office, Mangalore.)

MALAYALAM.

1932.

PART II.

For the 1st paper of three hours duration.—The following books are prescribed for non-detailed study for the essay.

1. Pratapasimhan—by D. Padmanabhanunni, M.A., Lecturer, Union Christian College, Alwaye.
2. Manimekhala—by C. I. Gopala Pillai, Maharaja's College of Arts, Trivandrum.

For the 2nd paper of two hours duration—

Poetry—(Detailed.)

1. Bharatam—Sambhavaparvam. Sakuntalōpakhyanam and Subhadraharanam—by Ezuthachan—(Any Press.)
2. Cherupaithal by P. Krishnan Nair (to be had of Sippukutti Menon, Achōth House, Chittur, Cochin State.)
3. Kavyōpaharam—by Kuttipurath Kesavan Nair, Maharaja's College, Ernakulam.
4. Naganandam Kilipattu—Edited by K. Parameswaran Pillai, M.A., Nantiyar Veetu, Thampanoor, Trivandrum,

5. Selections from Udayarasmi—by Pallath Raman, Kohinoor Publishing House, Ponnani, S. Malabar.
   (a) Sukumara Srishti.
   (b) Ahimsa Natta Nate.
   (c) Sevineeratnam.
   (d) Prema Vratham.

Drama—(Detailed.)

Priyadarsika—by Kadathanad Udayavarma Rajah—Badagara, N. Malabar.

Prose—(Detailed.)

1. Puranaratnangal by Chelnat Achyuta Menon, B.A., University Reader in Malayalam, Limbdi Gardens, Royapettah, Madras.
2. Viruthan Sanku—by Karat Achyuta Menon, B.A., B.L.—Mangalodayam Press, Trichur.

PART III-B.

The same as for 1931

Text-books for the Examinations of 1933.

ENGLISH.

PART I.

1933

Shakespeare:—Julius Cæsar.

Poetry.—

The Deserted Village. As published in "Four Favourite Poems" (Blackie).

The Rime of the Ancient Mariner. As published in "Four Favourite Poems" (Blackie).

Prose.—

Macaulay's Essays on Johnson and Goldsmith (Encyclopædia Brittannica Essays published in Bohn's Popular Library; Bell & Sons).

The Massacre of Glencoe and the Siege of Londonderry (published in "Narratives from Macaulay" edited by Johnson, Macmillan & Co.).

The Threshold of English Prose, (Treble, Cambridge University Press).

Sections.—

1. The Essay, omitting "The Proceedings of the Club of Authors".
2. The Letter.
3. Biography, omitting "Mr. Herbert" and "Milton's Juvenile Poems".
4. Travel.
5. History.
6. Public Speeches.

Non-detailed Study—

Tales of Action (Clarendon Press).

Kenilworth.

One Touch of Nature, Tickner, (University of London Press).

SANSKRIT.

1933

PARTS II AND III.

The same as for 1932, with the modification that *Harsacarita-samgraha* being replaced by "the first three *ucchvasas* only of the *purvapīṭika* in Dandin's Daśakumārcarita—Nirnayasagarȧ Press, Bombay."

MARATHI.

1933

PARTS II AND III-B.

For Non-detailed Study.—

1. Sukha ani Shanti.
2. Ragini Part I by V. M. Joshi, M.A.

For Detailed Study.—

1. Arvacheen Kavita (Poorvardh).
   (a) Extracts from Raghuvamsa by G. S. Lele, pages 54—90.
   (b) Extracts from Sir T. Madhava Rao's poems, pp. 97—104.
   (c) Extracts from G. V. Kanitkar, pp. 395—418.

2. Navanita:—

    (a) Extracts from Duyaneswari, pp. 1—14.
    (b) Extracts from Moropant, pp. 353—373. (Keka and Ambarisha Akhyan).

3. Venisamhar by Farashurampant Godbole.

4. Marathi ani Ingaraja by N. C. Kelkar, pp. 1—152.

5. Sambhaji *va* Rajaram, edited by Sane.

The above books can be had at Messrs. Parachure Puranick and Company, 'Madhav Bagh', Bombay.

ORIYA.

1933

Part II.

For Detailed Study.—

Poetry.—

Pranayaballari by G. Meher.

Prose.—

Payaschita by Pakhirmohan Senapati.

Drama.—

Pratap Nataka by Raja of Chikati.

For Non-detailed Study.—

1. Paschatyabhramana by Raja of Surangi.
2. Prabandha Prabisa by Vasudeb Mahapatro.

Part III-B.

1. Beera Oriya by Ramachandra Acharya.
2. Prabandhapatha by Mrutyunjaya Rath.
3. Debi by Upendra Prasad Mahanty.

The above books can be had at "The Mukur Press, Cuttack," or at "The Trading Company, Cuttack", or at "The Students' Stores, Berhampur, (Ganjam District)."

HINDI.

1933

PARTS II AND III-B.

The same as for 1932.

LATIN.

1933

PARTS II AND III-B.

Virgil : Aeneid IX.

Livy: A History-Book V.

Cicero: Pro Archia poeta.

FRENCH.

1933

PARTS II AND III-B.

Racine: Andromaque.

Lemaitre: Contes Blancs (Nelson).

About: Le Nez d'un Notaire (Macmillan & Co.)

Waston Bain's Selection of French Poetry for Advanced Students Nos. 60—80.

GERMAN.

1933

PARTS II AND III-B.

Schiller: Don Carlos.

Moderne Erzahlende Prosa (as in 1932).

W. Hauff, Das Wirtshaus im Spessart (Selection)—Introduction and Das kalte Herz. (pp. 1-7, 31-56, 136-156, in Macmillans' Edition.)

A book of German Verse, edited with introduction, etc., by H. G. Fiedler, for use in Schools and Colleges, published by the Clarendon Press, Oxford, (Nos. 105—108 inclusive).

ARABIC.

1933

PARTS II AND III-B.

The same as for 1932.

PERSIAN.

1933

PARTS II AND III-B.

Prose.—

Akhlaq-i-Kashifi—Edited by Ja'fari

Farsi-i-Jadid—Part III

Poetry.—

Muntakhabul Ash'ar—Edited by Sell.

Jami'ul Qawa'id by Azad.

URDU.

1933

PART II.

Kainath-i-Adab (Prose portion—from the beginning up to page 147 and Poetry—from pages 181 to 250 with the lives of the corresponding authors at the end of the book) available at Islamiah Book Depot, Kurnool.

Muntakhah Afsany 11th Volume—Non-detailed, (Urdu Markaz Library Series).

Arabun ka Fanni-Ta'mir.

Tahzibul Qawa'id—Part II—Grammar.

PART III-B.

The same as for 1932 with the modification that Tahzibul Qawa'id Part II is prescribed for grammar instead of Asasi—Urdu.

HEBREW.

1933

PARTS II AND III-B.

The same as for 1932.

TAMIL.

1933

PART II.

(*Selections published by the University*).

Poetry—

Naladiyar—1—5, Chapters	..	200
Kambaramayanam Angathan Thuthuppadalam	..	200
Purananuru 8, 9, 183, 186, 191, 312	..	48
Villiputhurar Bharatham; Sanjayan Thuthu	..	240
Cheyur Murugan Pillaitamil	..	80
Perasaippeyan—76, by C. R. Namasivaya Mudaliyar	..	280
Kalingathuparani—padaiyezucchi	..	100
Tirunutranthathi	..	125
		1273

Prose (Detailed)—

Prithivi Rajan by C. R. Namasivaya Mudaliar, Tamil Kadal Office, Mylapore,

Akbar by T. Chelvakesavaroya Mudaliar, M.A., Perambur.

Non-detailed—

1. Ekanathar by S. Anavaratavinayakam Pillai, M.A., L.T.
2. Iyarkai-pporut-katturai by P. T. Srinivasa Ayyangar, M.A., L.T.

PART III-B.

The same as for 1932.

TELUGU.

1933

Part II, Poetry (old).

Poetry.—

1. Bharathamu—Droupathi Swayamvaramu, Selection No. 16—1 to 121
2. Parijathapaharanamu—by Mukku Timmana—Canto V, 1 to 90
3. Harischandropakhayanamu—by Sankara Kavi, Canto III.
4. Modern Poetry—Kankanamu—by Bhogaraju Narayanamurthi.

Drama—

1. Uttararama Charithramu—by Balijayapalli Lakshmikantha Kavi, Guntur

Prose.—

1. Bhagahvathamu by Sathagantam Venkatarangayya Sastri—(published by V. Ramaswamy Sastrulu & Sons.) Dasamaskandhamu — first 100 pages.
2. Udayasundari—by Vidvan Dusi Ramamurthy Sastri, Vizianagaram.

Non-detailed.—

1. Veeravilasini—by G. Satyagodavari Sarma.
2. Prayaschittamu—Viswabarathi series—by Mandapaka Kameswara Sastry.

PART III-B

The same as under Part II with the following modifications:—

Omit Harischandropakhyanamu from Poetry, Bhagavathamu from Prose and Prayaschittamu from non-detailed and retain all the other text-books.

KANARESE.

1933

PARTS II AND III-B.

For Detailed Study—

(1) Jainimi Bharata by Lakshmisa, Sandhis 18 to 21 (both inclusive), omitting stanzas 30 to 35 (both inclusive) in Sandhi 18.

(2) Ajitha Thirthakara Purana Tilakam, by Ranna, (Mangalore Edition), Part I, from line 16 in page 26 up to the end of the Chapter. (Saraswati Printing Works, Ltd., Mangalore).

(3) Chanda Kausika Natakam by Basappa Sastri (Visva Karnataka Publishing House, Chickpet, Bangalore).

(4) Krishna Kumari (Revised Edition), by B. Rama Rao, M.A., LL.B., (Bala Sahitya Mandala, Ltd., Mangalore).

For Non-detailed Study—

(1) Sukhalata by R. Kalyanamma, (Sarasvati Office, Chamarajapet, Bangalore City).

(2) Sanna Kathegalu by "Srinivasa" (8 as.) (Visvakarnataka Publishing House, Chickpet, Bangalore City).

MALAYALAM.

1933

PART II.

For Composition and Translation—3 hour's paper.

1. Vidhi Vilasam, by A. P. Paramesvaram Pillai, B.A. c/o B. V. Book Depot, Trivandrum.

2. Manimala, Part II, by Chelnat Achyuta Menon, B.A., Limbdi Gardens, Royapettah, Madras.

For the 2 Hours Paper.

Poetry :—

1. Ayodhya Kandam—From Adhyatma Ramayanam by Ezuthachan—Any Press.

2. Sabha Pravesam—Thullal-The edition by P. K. Narayana Pillai, B.A., B.L., Judge, Trivandrum.

3. Karnabhushanam, by Ulloor S. Paramesvara Ayyar, M. A., B.L., Dewan Peishkar, Trivandrum.

4. Kumarasambhavam, 5th and 6th Sargams, by A. R. Raja Raja Varma, M.A., (B. V. Book Depot, Trivandrum.)

5. Nithisatakam—Barthruhari (Translation by P. K. Manavikraman Raja—Ramakrishna Press, Calicut.)

Prose :—

1. Vatsarajacharitam, by S. R. Prabhu, Sita Nivas, Kasaragod, S. Kanara.

2. Sitanirvasam, by R. Narayana Panickar, B.A., L.T., Trivandrum, (S.T. Reddiyar & Sons, or V. V. Press, Branch, Trivandrum.)

Drama :—

Prabhodhachandrodayam, by N. Kumaran Asan, (V. V. Press, Quilon.) Omitting the last two Acts.

PART III-B.

1. Magadalanamariam, by Vallathole Narayana Menon, (A. R. P. Press, Kunnamkulam, Cochin State.)

2. Irupathinnalu Vritham, 8th and 9th Vrithams, Edition published by Govinda Pillai, (V. V. Book Depot, Trivandrum.)

Drama :—

Mudrarakshasam, by Kannampuzha Krishna Warriar, Vidvan, (Sarada Printing Works, Trivandrum.)

Prose.—

Sarada (part I) by O. Chandu Menon (to be had of K. Madhava Menon, B.A., B.L., Vakil, Chalapuram, Calicut.)

APPENDIX III.

B. A. Degree Examination.

(New Regulations.)

COURSES AND SYLLABUSES.

Mathematics. (Main.)

Groups (i-a), (i-b) and (ii-a—Main).

(1) ALGEBRA AND TRIGONOMETRY.

Algebra.—Inequalities, limits, elementary theorems in convergence and divergence of series. The binomial theorem for a rational index. Exponential and logarithmic series. Partial fractions. Elementary methods for the summation of series. The elementary properties of continued fractions. Indeterminate equations of the first degree. Elementary properties of determinants. Typical graphs : $y=ax^n$, $y=a/x^n$, $y=ax+b+c/x$ $y=ax+b+c/x$. Graphical solution of cubic and biquadratic equations. General properties of the equation of the nth degree and its roots and coefficients. *Simple* transformations of equations. Reciprocal equations. Approximate solution of numerical equations.

Trigonometry.—Fuller treatment of the Intermediate Course. Quadrilaterals inscribed in and circumscribed about circles. Regular polygons. Limits of $\sin x/x$ and $\tan x/x$ as x tends to zero. DeMoivre's theorem and its *immediate* applications. Summation of elementary trigonometrical series.

(2) CALCULUS.

Calculus.—Standard forms and fundamental processes of differentiation and integration. Simple applications of the derivative to geometry, algebra, mechanics and physics. Maxima and minima values of a function of one variable. Theorem of mean value (graphical proof). Approximations and small errors. Curvature; Cartesian formula for the radius of curvature. Integration by substitution. Integration by parts. Integration regarded as summation, with simple applications to areas, volumes and surfaces and to mechanics. Solution of the differential equation of simple harmonic motion.

(3) GEOMETRY.

Pure Geometry.—As in the Intermediate Course, and, in addition, harmonic ranges and pencils. Inversion.

Geometry of the line, plane, sphere, the right cylinder and the right cone.

The fundamental geometrical properties of the conic sections.

Analytical Geometry.—The Cartesian equations of the straight line and the circle referred to rectangular axes, the parabola, ellipse, and hyperbola referred to their principal axes, and the rectangular hyperbola referred to its asymptotes. The general

equation of the second degree. The polar equations of the straight line, circle and the conic. Simple problems on the above.

Geometrical Conics.

Such leading properties of Conic Sections, as are specially suitable for treatment by elementary geometry.

Detailed Syllabus.

Focus-directrix definition of the conic; shape, axes of symmetry, centre, foci. The ellipse as orthogonal projection of a circle.

Geometrical treatment of the following propositions and their immediate applications.

1. If a chord PQ of a conic, whose focus is S, meets the corresponding directrix in R, SR is a bisector of PSQ.

2. The tangents from any point to a conic subtend equal or supplementary angles at a focus.

3. The semi-latus-rectum is a harmonic mean between the segments of a focal chord.

4. The locus of midpoints of parallel chords of a conic is a diameter.

5. The sub-tangent of a parabola is bisected at the vertex, and the sub-normal is constant.

6. The foot of the perpendicular from the focus on any tangent of a parabola lies on the tangent at the vertex.

7. The focal chord of a parabola parallel to the tangent at P is equal to 4 SP.

8. $PV^2 = 4$ SK. KV, where PV is an ordinate to the diameter of the parabola through K.

9. The sum or difference of the focal distances of any point on a central conic is constant.

10. The tangent and normal to a central conic at P are bisectors of SPS^1.

11. The feet of the perpendiculars from the foci on any tangent lie on the auxiliary circle, and the rectangle under these perpendiculars is constant.

12. The sum of the squares of conjugate diameters of an ellipse is constant.

13. The locus of meets of perpendicular tangents of a conic is a circle, which reduces to a straight line when the conic is a parabola.

14. Every plane section of a right circular cone or cylinder is a conic.

(4) DYNAMICS.

Dynamics.—Resolution and composition of displacements, velocities, and accelerations. Curves of speed and velocity diagrams. Motion of a particle in one plane under constant accele-

rations. Simple harmonic motion; composition of simple harmonic motions. Angular velocity and angular acceleration; moment of velocity.

Absolute units of force. Resolution and composition of forces. Angular momentum: moments of inertia in simple cases; the pendulum; determination of *g*. Work, energy, conservation of energy; energy diagrams. Impact; the ballistic pendulum. Simple cases of the dynamics of strings. Dimensions of dynamical units. Conditions of equilibrium of a body acted on by forces in one plane, Moments, couples. Centre of mass. The theory of simple machines. Laws of friction. Graphical methods with simple applications.

Group (i-a) only.

ASTRONOMY.

The apparent motion of the heavens. Circumpolar stars. The principal constellations and the most conspicuous stars.

The Celestial Sphere.—Points and lines on it:—Horizon, zenith, poles, meridian, etc.: the equinoctial points, etc.

Celestial co-ordinate; right ascension, declination, etc., latitude and longitude.

The transit circle, the equatorial, the clock, the transit theodolite. The sextant and the chronometer.

Phenomena depending on change of latitude and longitude of the observer. Magnitude of the earth.

The apparent annual motion of the sun. The constellations of the zodiac. The ecliptic and its obliquity. The equinoxes and the solstices. The earth's motion round the sun. The seasons.

Sidereal time, apparent solar time, mean solar time, equation of time. Standard time (India). Civil and astronomical reckoning. Conversion of time.

Explanation of astronomical refraction and parallax. Twilight.

Determination by observation of clock error and rate, of right ascension and declination of a heavenly body, and of the latitude and longitude of a station.

The solar system, and the motion of the planets, Kepler's laws. Comets and meteors.

The motion of the moon and her phases. The plane of her orbit. The nodes and their motion. The moon's sidereal and synodic periods. Her diameter and distance.

Distances and magnitudes of the sun, moon and planets.

Causes of the eclipses of the sun and the moon. Ecliptic limits. Number of eclipses in a year. The Calendar. The use of the Nautical Almanac.

HYDROSTATICS, PROPERTIES OF MATTER AND HEAT.

Hydrostatics.—Thrust of fluid on plane and curved surfaces. Centre of pressure in simple cases. Floating bodies and condi-

tions of stability. Properties of gases; determination of heights by barometer. Pumps, pressure gauges, and hydrostatic machines. Capillary phenomena and their explanation by surface tension; general theory of surface tension.

Properties of matter.—Elasticity. Hooke's Law. Compressibility of gases (at high and low pressure) and liquids. Compressibility and rigidity of solids; the elastic limits. Strains due to simple longitudinal pull; Young's modulus and its expression in terms of k and n. Bending in one plane of bars of simple cross sectional area; flexural rigidity: application to girders. Simple twisting of wires of circular cross sectional area by couple in plane at right angles to length; torsional rigidity; applications to torsion balance, and shafts.

Diffusion of liquids and gases; analogy with conduction of heat. Osmosis, viscosity. Pressure of a gas and its explanation on the kinetic theory; Avogadro's hypothesis; Van der Waal's equation.

Heat.—The methods of calorimetry and thermometry. Vapour pressure, critical temperature and pressure. Conduction and diffusion of heat and the determination of constants. Radiation and absorption; laws of cooling. Theory of exchanges; methods of measuring radiation. Laws of thermodynamics; simple applications.

Group (i-b)

Optional Subjects.

1. Astronomy.

The stars, the rotation of the earth, the celestial sphere. The principal instruments; determination of latitude and longitude. Distance and magnitude of the heavenly bodies. Refraction.

Simple problems connected with the diurnal motion. Apparent annual motion of the Sun, aberration; the equation of time. The nautical almanac. The motion of the moon; eclipses.

The stellar system.

Detailed Syllabus.

The most conspicuous stars. The principal constellations. The signs of the Zodiac. Double and multiple stars. Variable stars. Nebulae, comets and meteors.

The apparent motion of the heavens and its explanation by the rotation of the earth. Arguments and proofs for the earth's rotation. Foucault's gyroscope and pendulum experiments.

The celestial sphere and the different systems of co-ordinates.

The telescope. Reflectors and refractors. Advantages and disadvantages of the two. The transit theodolite. The transit instrument, meridian circle, the clock. The chronometer. The chronograph. The equatorial. Sextant. Zenith telescope. The principal errors of the transit instrument and their corrections.

Determination by observation of clock error and rate; the right ascension and declination of a heavenly body; latitude and longitude of a place on land or sea. Sumner's method.

Form and size of the earth. Phenomena depending on a change of the observer's place on the earth. Parallax (diurnal and annual). Distance and magnitude of the sun, moon and the planets and stars.

The atmosphere and the effect on astronomical observations. The tangent formula for refraction. Cassini's formula. Twilight.

Simple problems connected with the diurnal motion. (Right angled spherical triangle; sine and cosine formulae). The apparent annual motion of the sun and its consequences. The ecliptic and its obliquity. The position of the ecliptic at any given instant. The equinoxes and solstices. Determination of the first point of Aries and the obliquity of the ecliptic. Effects of precession and nutation.

The earth's motion round the sun. Aberration and its effects. Kepler's Laws and Newton's deductions therefrom. True anomaly, mean anomaly and lengths of the seasons. Sidereal Time. Apparent solar time. Mean solar time. Equation of time. The calendar. The use of the Nautical Almanac. Standard Time (India).

The motion of the moon and her phases. The nodes and their motion. The moon's sidereal and synodic periods. Eclipses and their causes. Ecliptic limits. Number of eclipses in a year. The Saros.

The solar system and the direct and retrograde motions of planets (coplanar circular orbits). The stationary positions, durations of direct and retrograde motions. Phases of planets.

A general descriptive idea of the stellar system.

Books recommended for Study.

1. Barlow and Bryan: Astronomy.
2. Ball: The Story of the Heavens.
3. Moulton: Introduction to Astronomy.
4. Russell, Dugan and Stewart: Astronomy, Volume I.
5. Spencer Jones: General Astronomy of chapters XII to XIV outlines only.
6. Parker: Astronomy.

Books for Reference.

1. Ball: Spherical Astronomy.
2. Russell, Dugan and Stewart: Astronomy, Volume II.
3. Hutchinson: Splendour of the Heavens, Volumes I and II.
4. Godfray: Astronomy

2. Elements of Statistics.

The course is intended to cover the elements of statistical method, and to give an introduction to the methods of computation.

(a) *Elements of Statistical Method.*

Collection of statistics, tabulation, computation, frequency distribution, correlation table.

(b) *Applications.*

A candidate will be expected to show some knowledge of the application of statistical methods to the following: index numbers, mortality table.

(c) *Practical Work.*

A candidate shall have undergone a course of practical instruction which should extend to about twenty-five hours.

This should cover:—

Computation and plotting, including use of tables and of semi-logarithmic paper, tabulation, use of the histogram, sketching of frequency curve from histogram; fitting of normal curve; determination of deviation, medium. Simple case of correlation co-efficient.

Exercises on subjects in (b).

Detailed Syllabus.

(a) *Elements of Statistical Method.*

Collection of Statistics.	Objects in view. Census as an example. Variables. Scheme. Principles to be observed. Size of samples required.
Tabulation	Classes. Choice of class interval.
Computation	Semi-logarithmic paper, Multiplication Tables, Barlow's Tables, Slide rule, Pearson's Tables.
Frequency Distribution, (One variable).	Histogram. Frequency polygon. Chance distribution, binomial, normal curve, frequency curve. Average; mean, median, mode. Skewness. Dispersion, mean deviation, standard deviation. Ogive, quartiles, probable error. Sampling.
Correlation Table, (Two variables)	Co-efficient of correlation, regression lines, correlation ratio.

The following book is recommended:—

Gavett, G. Irving, First Course in Statistical Method, Mc. Graw Hill Publishing Co., London.

3. ECONOMICS.

Will be prescribed later.

4. PURE GEOMETRY.

Properties of triangles. Coaxal systems of circles. Inversion. Conical and orthogonal projections. Cross ratios. Projective ranges and pencils. Involution. Non-focal properties of conics. The cross-ratio properties of conics. Reciprocation. Duality. Circular points.

Detailed Syllabus.

Properties of triangles (isogonal conjugates, Lemoine points and the two Lemoine circles). The coaxal system of circles; limit points. The theory of inversion.

General properties relating to conical and orthogonal projection. Imaginary elements and the principle of continuity. Desargues's theorem of projective triangles. Cross ratios. Projective ranges and pencils are equicross and conversely. Two projective ranges on the same straight line have two self-corresponding points. Harmonic section; harmonic property of the pole and polar of a circle; of the complete quadrilateral and the complete quadrangle. Pappus's theorem.

The involution range and the involution pencil. The double elements are separated harmonically by every pair of corresponding elements. If AA_1, BB_1, CC_1 are in involution, the ranges $ABCA^1$, $A^1B^1C^1A$ are equicross and conversely. Two involution-ranges on the same line have one and only one common corresponding pair. The definition of the circular points by means of the orthogonal involution pencil.

The study of the conic as projection of the circle. Non-focal properties common to all conics. Properties of the parabola, ellipse, hyperbola, rectangular hyperbola.

Cross ratio properties of conics. Pascal's and Brianchon's Theorems. Projective and involution ranges on a conic.

Reciprocation with respect to a conic, and with respect to a circle. Duality.

Every circle passes through the circular points, and every conic through the circular points in a circle. Concentric circles have double contact at the circular points. The cross ratio O(-Ω- -Ω- AB) depends only on the angle AOB. The definition of the foci of a conic by means of the circular points.

5. Analysis.

i. Differential and Integral Calculus.

Limit of a function. Differentiation. Mean value theorem and Taylor's series. Geometrical applications.

Integration as an inverse process. Reduction formulae.

Integral as the limit of a sum. Simpson's rule.

Application of integration to mensuration.

ii. Infinite Series and Products.

Infinite sequences. Sequence definition of *e*.

Tests for series. Exponential theorem.

Infinite products, sin x and cos x as infinite products.

The complex variable, the elementary transcendental functions of the complex variable.

iii. Differential Equations.

Formation of differential equations.

Solution of the simplest types.

Detailed Syllabus.

(i) Differential and Integral Calculus.

Monotonic functions. Continuous and discontinuous functions with graphical illustrations. Limit of a function. Standard limit theorems required for differentiation.

Rules of differentiation. Successive differentiation. Leibniz's Theorem.

Rolle's Theorem. Mean value theorem with Lagrange's and Cauchy's form of remainder. Applications to maxima and minima, to indeterminate forms. Infinite Taylor expansions of elementary functions like exp x, sin x. log $(1+x)$, etc., proofs.

Application of the derivative to plane curves; tangent; normal, etc., in Cartesian and polar co-ordinates. (p, r) equations, pedals.

Curvature—formulæ in rectangular and polar co-ordinates. Intrinsic equations, evolutes, envelopes.

Properties of the cycloid, cardioid, and catenary.

Integration as an inverse process. Standard forms. Reduction formulae.

Definite integral as a limit of a sum. Proof of the existence of limit when function is monotonic. Reduction formulae for definite integrals. Approximate integration. Simpson's rule.

Application of integrals to mensuration. Areas and lengths of plane curves in cartesian and polar co-ordinates. Volumes and areas of surfaces of revolution. Centre of inertia, moments of inertia, of plane laminas and solids of revolution.

(ii) *Infinite Series and Products.*

Infinite sequences and the classification of their modes of behaviour. Monotonic sequences. Bounded monotonic sequences tend to a limit (only intuitive proof). Standard limits including limits of $\left(1+\frac{1}{n}\right)^n$, $\left(1-\frac{1}{n}\right)^{-n}$.

Cauchy's condensation test. Dirichlet's and Abel's tests. Absolutely convergent double series. Theorems on the multiplication of absolutely convergent series. Application to the proof of the exponential theorem.

Convergence of infinite products $\Pi(1+a_n)$, $\Pi(1-a_n)$, when $0 < a_n < 1$

Infinite products for $\sin x$, $\cos x$.

Power series in a complex variable ; circle of convergence. Simple properties of exp z, log z, sin z, tan z, sin z, etc., z being a complex variable. Easy examples in the summation of trigonometric series, and in the expansions of trigonometric functions including inverse function.

(iii) *Differential Equations.*

Formation of Differential Equations.

Variable Separable.

Homogeneous Equations $M+N\frac{dy}{dx}=0$.

Linear Equations $\frac{dy}{dx}+Py=Q$.

Geometrical interpretation of a differential equation of the first order and first degree.

Orthogonal trajectories, (Cartesian and polar co-ordinates).

Differential equation of the second order of the following types:

$$\phi\left(\frac{d^2y}{dx^2}, \frac{dy}{dx}, Vx\right)=0,$$

$$\phi\left(\frac{d^2y}{dx^2}, \frac{dy}{dx}, y\right)=0,$$

$$\frac{d^2y}{dx^2}+P\frac{dy}{dx}+Qy=R.$$

where P, Q, R are functions of x, and a solution of the equation with the right-hand side zero is known.

Linear equations with constant coefficients:

$$\frac{d^n y}{dx^n} + A_1 \frac{d^{n-1}y}{dx^{n-1}} + \ . \ . \ . \ + A_n \ y = V$$

where V is a sum of functions of the type exp nx, sin nx, cos nx ; x^n.

Simple geometric and dynamical applications of the above equations.

(ii-b) Physics—Main.

The course includes a more extended study of the matter included in the Intermediate course and in addition the following:—

Dynamics.—Resolution and composition of displacements, velocities, and accelerations. Curves of speed and velocity diagrams. Motion of a particle in one plane under constant accelerations. Simple harmonic motion; composition of simple harmonic motions; Angular velocity and angular acceleration; moment of velocity.

Absolute units of force. Resolution and composition of forces. Angular momentum; moments of inertia in simple cases, the pendulum; determination of g. Work, energy, conservation of energy, energy diagrams. Impact, Dimensions of dynamical units. Conditions of equilibrium of a body acted on by forces in one plane. Moments, couples. Centre of mass. The theory of simple machines. Laws of friction.

Properties of matter.—Elasticity: Hooke's Law. Compressibility of gases (at high and low pressure). Rigidity of solids; the elastic limits. Strains due to simple longitudinal pull; Young's modulus and its expression in terms of k and n. Experimental study of bending in one plane of bars of simple cross sectional area; application to girders. Simple twisting of wires of circular cross sectional area, by couple in plane at right angles to length; torsional rigidity; applications to torsion balance, and shafts.

Diffusion of liquids; analogy with conduction of heat. Osmosis, Experimental study of Viscosity. Pressure of a gas and its explanation on the kinetic theory; Avogadro's hypothesis: Van der Waal's equation.

Hydrostatics.—Thrust of fluid on plane surfaces. Centre of pressure in simple cases. Floating bodies and conditions of stability. Properties of gases. Pumps, pressure gauges, and hydrostatic machines. Capillary phenomena and their explanation by surface tension.

Heat.—Expansion, calorimetry and thermometry, Vapour pressure, critical temperature and pressure. Conduction of heat and determination of conductivity. Radiation and absorption; laws of cooling. Theory of exchanges; methods of measuring radiation. Mechanical equivalent of heat; Carnot's Theorem, absolute scale of temperature.

Light.—Velocity of light. Illumination; photometry. Aberration, spherical and chromatic; direct vision spectroscope.

The wave theory; simple interference phenomena, Huygens' principle. Explanation of straight line propagation, reflexion and refraction of light. Simple diffraction phenomena. Plane Gratings and wave length determination. Spectrum analysis; Doppler's principle. Double refraction and polarization of light; rotatory polarization; simple applications.

Magnetism.—Forces on a magnet in a magnetic field. Determination of the axis and moment of a magnet; determination of field strength. Magnetic shell: magnetic potential due to a shell of uniform strength. Total normal induction, Gauss' theorem; number of lines of force. Magnetic induction in iron, etc. Theory of magnetism.

The magnetic field of the earth; the magnetic elements and their determination.

Electricity.—Electric capacity; specific inductive capacity. Distribution of electricity on surface of conductors. The mechanical force on charged conductors; energy of electrified systems. The dielectric constant.

Wheatstone's bridge; specific resistance; resistance thermometers. Conductivity of electrolytes; ionization; migration phenomena; accumulators, standard cells; the potentiometer system of measurement. Thermoelectric phenomena. Electromagnetic induction; Co-efficients of induction; induction coils; mechanical force on conductors carrying current; moving coil instruments. Lenz's law; illustration from dynamos and motors, etc. Experimental wireless and X-rays.

The experimental study of the continuous current dynamo and motor and of the alternate current dynamo. General principles of the application of electricity to lighting, power transmission, telegraphy, etc.

Sound.—The transmission of energy through material media by wave motion; speed of propagation of waves of permanent type. Nature of musical sound; scales. The vibration of strings, and gas columns; resonance. Interference and diffraction phenomena. Analysis of sound. Measurement of wave length, velocity and pitch.

A practical examination will be held to test the candidate's acquaintance with the phenomena and his ability to show them, as well as his ability to make physical measurements. At the practical examination candidates must submit to the Examiner or Examiners their laboratory note-books duly certified by their professors or lecturers as a *bona fide* record of work done by the candidates.

Books for Study—

Wagstaff: Properties of Matter (Clive).

Edser: General Physics (Macmillan).

Poynting and Thomson: Sound (Griffin).

Capstick: Sound (Cambridge University Press).

Edser: Heat (Macmillan).

Edser: Light (Macmillan).

Hadley: Electricity and Magnetism (Macmillan).

Brooks and Poyser: Electricity and Magnetism (Longmans).

Whetham: Experimental Electricity (Cambridge University Press).

Schuster and Lees: Practical Physics.

Allen and Moore: Text-book of Practical Physics (Macmillan).

Ivor-B. Hart	...	An Introduction to Advanced Heat.
Draper	...	Heat and Thermodynamics.
Houston	...	Light.

Reference—

Porter: Intermediate Course in Mechanics (Murray).

Poynting and Thomson: Heat (Griffin).

Clay: Treatise on Practical Light (Macmillan).

Watson: Practical Physics (Longmans).

(ii-c) Chemistry—Main.

General Theoretical Chemistry and Physical Chemistry.—The methods of determining equivalents; atomic and molecular weights; the atomic theory; valency; osmotic pressure; the kinetic theory of gases; the properties of solutions; electrolysis and theory of electrolytic dissociation; the relations of the physical properties of substances to their chemical nature, with special reference to the rotation of the plane of polarization, to refraction and dispersion, crystalline form, atomic and molecular volume, emission and absorption spectra.

The law of mass action; the velocity of chemical change; and the relations of chemical energy to heat, and to electrical energy.

The elements (excluding the rare metals) and their compounds studied in detail.

Chemistry of the carbon compounds treated from an elementary standpoint:—

(1) Composition, purification and analysis of organic compounds.

(2) The hydrocarbons of the methane, ethylene and acetylene series and their derivatives.

(3) The alcohols, aldehydes, ketones and their derivatives.

(4) The allyl derivatives of the more important elements.

(5) The fatty acids and their derivatives.

(6) The hydroxy acids and their derivatives.

(7) The unsaturated acids and their derivatives.

(8) The more important members of the carbohydrate group.

(9) Benzene, naphthalene, anthracene and their more important derivatives and reactions.

The practical examination in Chemistry will include—

1. Qualitative analysis, including analysis of mixtures of mineral substances.

2. Quantitative analysis, including (*a*) the estimation of alkalis, alkaline carbonates, and acids, by neutralization, (*b*) determinations involving the use of the permanganate, dichromate, iodine and thiosulphate processes, (*c*) the estimation of

chlorides and cyanides by titration with silver nitrate, and also with thiocyanate, (*d*) gravimetric determinations of iron, calcium, copper, silver, lead, sulphuric acid, hydrochloric acid, phosphoric acid.

Candidates will be required to be able to standardize the solutions for volumetric analysis.

3. The determination of molecular weights.

4. Preparation of at least six simple organic substances: *e.g.*, Chloroform, Ether, Ethylacetate, Acetic Anhydride, Urea, Nitrobenzene, Aniline; Phenol; Benzoic Acid (from Toluene), Iodobenzene, Salicylic acid, Azo-dye, etc.

At the practical examination, candidates must submit to the Examiner or Examiners their laboratory note books (duly certified by their professors or lecturers) as a *bona fide* record of work done by the candidates.

Books for Study—

Partington: Text-book of Inorganic Chemistry (Macmillan).

Mellor: Modern Inorganic Chemistry (Longmans).

Caven and Lander: Systematic Inorganic Chemistry (Blackie).

Senter: Outlines of Physical Chemistry (Methuen).

Lowry and Sugden's Physical Chemistry (Macmillan 4s. 6d.).

Thorpe: History of Chemistry, 2 Volumes (Watts).

Caven: Systematic Qualitative Analysis (Blackie).

Caven: Quantitative Chemical Analysis, Parts 1 and 2 (Blackie).

Thorp: Inorganic Chemical Preparations (Ginn).

Cohen: Practical Organic Chemistry for Advanced Students (Macmillan).

Taylor: Practical Physical Chemistry (O. U. P.)

Weston: Detection of Carbon Compounds (Longmans).

Perkin and Kipping: Organic Chemistry (Chambers).

Moreau: Fundamental Principles of Organic Chemistry (Bell).

Coward and Perkins: Exercises in Chemical Calculations (Arnold).

Reference—

Lowry: Text-book of Inorganic Chemistry (Macmillan).

Walker: Introduction to Physical Chemistry (Macmillan).

Russell: Chemistry of Radio-active Substances (Murray).

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The same as above with the following modifications :

Remove Lowry's Text-book of Inorganic Chemistry from the list of reference books, and include among the ordinary text books, and (b) add under 'Reference' Read's Text-book of Organic Chemistry (G. Bell & Sons, 12*s.* 6*d.*).

Botany, Zoology, Geology and Physiology.

In the parts covered by both syllabuses (of any one subject) the knowledge required for the examination in the subsidiary shall be less detailed than that in the main subject.

(ii-d) Botany—Main.

1. The main points of structure, development, life history and the taxonomic relation of the following groups in general and the Genera in particular:—

Bacteria.

Cyanophyceæ.

Oscillaria, Nostoc, Rivualria.

Chlorophyceæ.

Chlamydomonas, Pandorina, Eudorina, Pleodorina, Volvox, Ulothrix, Oedogonium, Enteromorpha, Pleurococcus, Cladophora, Vaucheria, Caulerpa, Spirogyra, Desmids, Chara or Nitella, Diatoms.

Phæophyceæ.

Ectocarpus, Fucus, Dictyota.

Rhodophyceæ.

Battrachospermum, Polysiphonia, Gracilaria.

Phycomycetes.

Phytophthora, Saprolegnia, Mucor, Rhizopus.

Ascomycetes.

Erysiphe, Peziza, Saccharomyces.

Basidiomycetes.

Ustilago, Puccinia, Agaricus, Polyporis.

Lichens.

Bryophytes.

Riccia, Fimbriaria, Anthoceros and any one Moss.

Pteridophytes.

Any one Polystelic Fern, Marsilia, Lycopodium, Selaginella.

Gymnosperms.

Pinus, Cycas.

2. The external morphology of flowering plants.

3. The general principles of classification and the distinguishing characteristics of the following Natural Orders as used in the Flora of British India:—

Anonacæ.
Nymphæaceæ.
Capparideæ.
Guttiferæ.
Malvaceæ.
Sterculiaceæ.
Geraniacæ.
Rutaceæ.
Meliaceæ.
Rhamnæ.
Sapindaceæ.
Anacardiaceæ.
Papilionaceæ.
Cæsalpineæ.
Mimoseæ.
Rosaceæ.
Combretaceæ.
Myrtaceæ.
Lythraceæ.
Cucurbitaceæ.
Umbelliferæ.
Rubiaceæ.
Compositæ.
Sapotaceæ.
Apocynaceæ.
Asclepiadeæ.
Boragineæ.
Convolvulaceæ
Solanaceæ.
Scorphularineæ.
Acanthaceæ.
Labiatae.
Verbenaceæ.
Amarantaceæ.
Loranthaceæ.
Euphorbiaceæ.
Urticaceæ.
Laurineæ.
Orchidæ.
Scitamineæ.
Amaryllideæ.
Liliaceæ.
Commelinaceæ.
Palmeæ.
Aroideæ.
Cyperaceæ.
Gramineæ.

4. *Plant Physiology.*

The chemical composition of the plant. Materials of plant food and their sources. The nature of soil and importance of its constituents and micro-organisms. Movements of water and gases. Assimilation of carbon and nitrogen. Transpiration and translocation of the assimilated products. Metabolism. Parasitism and other special modes of nutrition. Respiration. The influence of light, heat and gravity. Growth, movements and irritability in plants. Sexual reproduction and its significance. Vegetative reproduction. The phenomena of cross-fertilization. Variation, Heredity, and Mendelism, Theories of Evolution and Origin of Species.

5. *Histology.*

The structure and modes of the division of the cell, and the nature of its contents. The nature and mode of origin of plastids, cell sap and other cell contents. The physical and chemical properties of protoplasm and cell wall. The origin, nature, and development of plant tissues, primary and secondary tissues and their distribution in the plant body.

Practical Work.

Candidates are expected to be able to make preparations illustrating the form and structure of any plant of the Groups or Orders mentioned in the syllabus and to describe them with sketches sufficient for their identification; to make dissections with the simple microscope of the floral parts of Phanerogams, and to make drawings, construct floral diagrams and refer them to their Natural Orders; to describe in technical language plants belonging to any of the Orders or Groups specified in the syllabus.

At the practical examination each candidate must submit his laboratory note-book, and a collection of named plants collected and preserved by himself.

Books for Reference—

Coulter, Barnes and Cowles: Text book of Botany.

Ganong: Text book of Plant Physiology.

Bower: The Living plant.

Strasburgher: Text-book of Botany.

(ii-e) Zoology—Main.

The Scope of Zoology.—The leading features in the structure, the most important points concerning the development, the affinites, and the general classification of the forms included in the following groups (except in rare cases, no knowledge of extinct forms will be required):—

Protozoa. Porifera. Cœlenterata. Platyhelmia. Nemertini, Nematoda, Acanthocephala, Chætognatha, Rotifera,

Brachiopoda. Annelida. Phoronidea. Polyzoa. Arthropoda. Mollusca. Echinodermata. Chordata.

A general acquaintance with the vertebrate fauna of South India.

The geographical distribution of the more interesting groups of the Chordata. Outlines of the theory of organic evolution. Evidences on which the theory is based.

Candidates will be required to examine, describe, identify, or otherwise deal with specimens and preparations illustrating points of zoological interest in connection with any of the preceding groups. They will, in addition, be expected to have a full practical knowledge of the structure, and will be required to make dissections and simple microscopic preparations of any of the following types:—

Amœba. Vorticella. Hydra. Earthworm. Leech. Prawn and Crab (external characters). Scorpion. Centipede (external characters). Cockroach. Fresh-water Mussel. Amphioxus (preparations and sections). Dogfish (skeleton). Frog. Pigeon. Hare.

Candidates may also be examined by *viva voce* questions.

Books for Study—

1. Parker and Haswell: Text-book of Zoology—2 Vols. (Macmillan).
2. Shipley and MacBride: Text-book of Zoology—2 Vols. (Cambridge University Press).
3. Borradaile: Manual of Zoology (Oxford University Press).
4. Bourne (G. C.): Comparative Anatomy of Animals 2 Vols. (George Bell & Sons).
5. Graham Kerr: Evolution (Macmillan).

Practical—

1. Marshall: The Frog. (Macmillan).

   Marshall and Hurst: Practical Zoology (Smith Elder & Co.).

Reference—

1. Sedgwick (A): Student's Text-book of Zoology—3 Vols. (Swan Sonnenschein).
2. Lang (A): Text-book of Comparative Anatomy—2 Vols. (Macmillan).
3. Weidersheim: Elements of the Comparative Anatomy of Vertebrates (Macmillan).

4. Borradaile: Animal Life and its Environment (Henry Frowde and Hodder and Stoughton).

5. Lull: Organic Evolution: (Macmillan).

6. Kingsley: Comparative Anatomy of Vertebrates. (George Bell & Sons).

7. H. Reynolds: Vertebrate Skeleton (C. U. P.).

8. Holmes: Biology of the Frog, (Macmillan).

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The same as those for 1932 with an addition under 'Reference' De Beer: Vertebrate Morphology (Sidgwick and Jackson, Ltd.)

(ii-f) Geology—Main.

I. Physiography.
II. Mineralogy and Crystallography.
III. Petrology.
IV. Structural and Field Geology.
V. Stratigraphy and Palæontology.

(i) Physiography.

An elementary course of lectures on the following:—

The earth as a planet, its general relations to the other members of the solar system, hypotheses as to the origin of the earth; form, size and density of the earth; its movements and their effects.

The Atmosphere—its composition, height, density; pressure, temperature, moisture and movements; weather, refraction, twilight, and aurora-borealis.

The Hydrosphere—its composition, extent and distribution, depth, temperature and movements.

The Lithosphere—the chief constituents of the earth's crust, the general characters and mode of occurrence of igneous and sedimentary rocks. Condition of the interior of the earth.

Agents of geological change.—The hypogene and epigene agents of geological change, manner and results of their action, especially as influencing earth-sculpture—the destruction, construction, and gradual evolution of the crust of the earth and of its surface features.

Fossils, the main conditions favourable for their formation and preservation and their value as interpreters of the past history of the earth.

Climates—their causes and distribution; glacial epochs.

Simple facts about the geographical and geological distribution of the chief types of plant and animal life. Antiquity of man. Views as to the age of the earth's crust.

(ii) Mineralogy and Crystallography.

Symmetry; lines, planes and axes of symmetry; laws of Crystallography; the common holohedral, hemihedral and hemimorphic crystal forms and combinations under each of the six crystal systems; the more important types of twins and twinning; drawing of the more important crystal forms; systems of crystal notation, use of the contact Goniometer.

The principal physical properties of minerals which aid in the recognition of the various mineral species.

Isomorphism, paramorphism, pseudomorphism and dimorphism.

The chief characteristic of all the more abundant minerals including both those which are of geological interest and those of commercial value, their modes of occurrence and uses.

The practical determination of the chief physical and chemical properties of the commoner ores and minerals, including the use of the blowpipe.

(iii) Petrology.

The classification and distribution of rocks, and the composition, structure, texture, origin and mode of occurrence of all the more important types and their metamorphic and altered forms.

Contact and Regional Metarmorphism.

The macroscopic and microscopic examination of rocks including the determination of the simpler optical characters of the chief rock forming minerals in parallel polarized and convergent light. Preparation of diagrams or sketches to represent features observed in rock sections under the microscope. Construction and use of a simple petrological microscope.

(iv) Structural and Field Geology.

The more important lithological and structural features of rocks, their origin or formation; structure of mineral veins. Diagrammatic sketches of the above.

Construction and Interpretation of geological maps and sections. Tracing of outcrops. Simple problems in Structural Geology.

(v) Stratigraphy and Palæontology.

The chief petrological and palæontological characters of the main geological divisions and their Indian representatives and the probable physical conditions under which they were formed. Geology of India.

Fossils, their nature and preservation. The main groups of vegetable and animal life and their distribution in time.

The characters, classification and distribution of the more important types of fossils—especially Indian; identification and sketching of fossils; causes for the imperfection of the geological record; the general succession of life as revealed thereby and the general evidence furnished in support of evolution; principles of correlation; Homotaxis.

(vi) Practical Examination.

The knowledge of the candidate in accordance with the syllabus will be tested also by practical examination. *Viva voce* questions may be asked, acquaintance with field work is necessary.

Books for study.—

Judd	...	Students' Lyell.
Williams	...	Crystallography.
F. Rutly	...	Mineralogy.
A. Geikie	...	Class-book of Geology.
Hatch and Wells	...	Petrology (Igneous Rocks).
Hatch & Rastall	...	Petrology (Sedimentary Rocks).
Harker	...	Petrology.
Wadia	...	Geology of India.
Woods	...	Invertebrate Paloeontology.

Reference Books.—

Chamberlin & Salisbury.		College Geology.
Lake & Rastall	...	Text-book of Geology.

(ii-g) Physiology—Main.

Will be prescribed later.

Mathematics—Subsidiary.

The course shall comprise the study of the following subjects:—

Algebra and Trigonometry, Analytical Geometry and Calculus.

The examination shall consist of two papers of three hours' duration each.

The problems set for the subsidairy papers will in general be of a lower standard than for the main papers in the same subjects and will as far as possible relate to scientific topics.

Algebra and Trigonometry. Simple practical applications of the binomial, exponential, and logarithmic series; compound interest law.

Complex numbers, their geometrical representation; de Moivre's theorem and its immediate applications. Use of the expansion of the sine and cosine in power series.

Analytical Geometry as for Main excluding the general equation of the second degree and polar equations.

Calculus—Same as for Main.

Physics—Subsidiary.

Properties of Matter.

Compressibility of gases (at high and low pressures). Diffusion of liquids. Osmosis, viscosity, pressure of a gas, and its

explanation on the kinetic theory; Avogadro's hypothesis, Van der Waal's equation.

Hydrostatics.

As for candidates taking Physics Main, but *excluding* "Thrust on plane surfaces. Centre of pressure in simple cases. Floating bodies and conditions of stability."

Heat.

As for candidates taking Physics Main.

Light.

As for candidates taking Physics Main, but *omitting* "geometrical optics".

Electricity.

As for candidates taking Physics Main, but *excluding* Statical Electricity.

The examination in these subjects will be of a less advanced character than that for candidates taking Physics as a main subject.

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TEXT-BOOKS.

The same as for B.A. (New), Main 1933, omitting portions in the list of books not included in the syllabus.

Chemistry—Subsidiary.

General Chemistry.—The atomic Theory. Valency. Methods of determining equivalents, atomic weights and molecular weights. Properties of solutions. Osmotic pressure. The Law of Mass Action.

Inorganic Chemistry.—A thorough knowledge of the chemistry of the elements included in the Intermediate syllabus, with the addition of Strontium, Cadmium, Cobalt and Nickel, studied from the point of view of the Periodic classification.

Organic Chemistry.—The syllabus for this course is the same as that for the B.Sc. Course (Subsidiary) as given on page 244.

Practical Chemistry.—Qualitative analysis of substances containing not more than one acid and one base. Simple volumetric analysis with standard solutions of acids, alkalis, potassium permanganate, iodine and sodium thiosulphate.

Books for Study—

Barret, W. H.: Elementary Physical Chemistry (Ed. Arnold).
Lowry & Austin: Organic Chemistry (Macmillan).
Smith: Introduction to Inorganic Chemistry (Bell).
Senter: Outlines of Physical Chemistry (Methuen).
Thorpe: History of Chemistry, 2 Volumes (Watts).
Caven: Quantitative Chemical Analysis Part I, (Blackie).
Thorpe: Inorganic Chemical Preparations (Ginn).

Reference—

Partington: Text-book of Inorganic Chemistry (Macmillan).

Lowry: Historical Introduction to Chemistry (Macmillan).

Taylor: Practical Physical Chemistry (O. U. P.).

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Add under 'Reference' Holmyard's Introduction to Organic Chemistry (Arnold, 4*s*. 6*d*.).

Botany—Subsidiary.

(1) The structure and life history of the following:—

Bacteria, Oscillaria, Nostoc, Chlamydamonas, Pandorina, Eudorina, Pleodorina, Volvox, Ulothrix, Oedogonium, Spirogyra, Ectocarpus, Polysiphonia, Chara or Nitella, Rhizopus, Puccinia, Agaricus, Lichens, Riccia, any one Moss, Selaginella, any one Polystelic Fern, Cycas, Pine.

(2) External Morphology of Flowering Plants.

(3) The general principles of classification and the characteristics of the following families:—

Anonaceæ, Nymphœaceæ, Leguminosæ, Malvaceæ, Rutaceæ, Myrtaceæ, Cucurbitaceæ, Rubiaceæ, Compositæ, Apocynaceæ, Asclepiadaceæ, Convolvulaceæ, Solanaceæ, Acanthaceæ, Labiatæ, Amarantaceæ, Euphorbiaceæ, Urticaceæ, Liliaceæ, Amaryllideæ, Scitamineæ, Orchideæ, Palmæ, Cyperaceæ, Gramineæ.

(4) Plant Physiology:—

Chemical composition of the plant, soil and its nature. Photosynthesis, Transpiration, Respiration, Metabolism, Heterotrophic Plants, Growth, Movements, Irritability, Reproduction (Sexual and Asexual), Cross and Self Fertilization, Variation, Heredity and Mendelism. Theories of Evolution and the Origin of Species.

(5) Histology:—

Cell structure and Cell division, plastids, cell-sap, other cell contents, the origin, nature and development of plant-tissues. Primary and secondary tissues and their distribution in the plant body.

Zoology—Subsidiary.

The scope of Zoology :—The leading features in the structure, the most important points concerning the development, and the affinities of the forms included in the following Phyla in general and of the following types in particular.

Students will not be expected to be familiar with characters of orders or other subgroups not mentioned in the following scheme.

Protozoa—*Rhizopoda.* (Lobosa, Foraminifera, Heliozoa and Radiolaria.)

Mastigophora. (Flagellata)

Infusoria. (Ciliata)

Sporozoa.

Types: Amoeba, Euglena, Volvox, Paramoecium, Vorticella, Monocystis and Malarial Parasite.

Coelenterata—*Hydromedusae.*—(Hydrida, Gymnoblastea, Anthomedusae, Calyptoblastea, Leptomedusae, Trachymedusae, Narcomedusae, Hydrocorallina and Siphonophora).

Scyphomedusae. (Stauromedusae, Coronata, Cubomedusae and Discomedusae).

Anthozoa. (Zoantharia and Alcyonaria)

Ctenophora.

Types: Hydra, Obelia, Aurelia, Sea-Anemone and Hormiphora.

Platyhelminthes— Types—Taenia and Liver Fluke. (Fasciola)

Nemathelminthes—Type—Ascaris.

Annelida— Archiannelida
Chaetopoda (Polychaeta and Oligochaeta)
Hirudinea
Echiuroidea

Types—Nereis, Earthworm and Leech.

Arthropoda —*Crustacea.* (Entomostraca and Malacostraca)

Types—Streptocephalus, Lepas, Sacculina, Prawn and Crab.

Onycophora—Peripatus.

Myriapoda (Centipedes and Millipedes)

Insecta. (Aptera, Orthoptera, Coleoptera, Neuroptera, Hymenoptera, Hemiptera, Diptera and Lepidoptera)

Type : Cockroach.

Arachnida (Scorpions, Spiders and Kingcrab)

Type—Scorpion.

Mollusca—Pelecypoda
Gastropoda
Cephalopoda

Types—Mussel, Chiton, Pila (Ampullaria) and Sepia

Echinodermata—Asteroidea.
Ophiuroidea.
Echinoidea.
Holothuroidea.
Crinoidea.

Types—Star-fish, Brittle-star, Sea-urchin, Sea-Cucumber and Feather Star.

CHORDATA.

Prochordates—Balanoglossus, Ascidia and Amphioxus.

Vertebrata—Pisces—Elasmobranchii.
Teleostomi.
Dipnoi.

	Amphibia	Anura Urodela Gymnophiona.
	Reptilia	Lacertilia Ophidia Chelonia Crocodilia
	Aves	Archeornithes Neornithes—(Ratitae and Carinatae).
Mammalia	Prototheria.	
	Metatheria	Diprotondontia Polyprotodontia
	Eutheria	Edentata Sirenia Cetacea Proboscidea Ungulata Hyracoidea Rodentia Carnivora Insectivora Chiroptera Prosimiae Primates.

Types—Balanoglossus, Ascidian, Amphioxus, Dog fish, Bony fish, Frog, Calotes, Pigeon and Rabbit.

A general knowledge of the theory of Evolution.

Practical Work—

Candidates will be expected to have a practical knowledge of the structure and shall be required to make dissections and simple microscopic preparations of any of the following types :—

Earthworm, Nereis, Leech, Prawn (external features); Scorpion; Cockroach; Freshwater mussel, Ampullaria, Sepia (external features) Frog (sympathetic system and 7th cranial nerve excepted); Pigeon, Rabbit (nerves excepted).

Books for Study—

Theory—

1. Shipley and MacBride: Text-book of Zoology (Cambridge University Press).

2. Borradaile: Manual of Zoology (Oxford University Press).

3. Kerr: Organic Evolution (Macmillan).

4. College Zoology: Hegner—Macmillan & Co., New York.

Practical—

1. Marshall: The Frog (Macmillan).

2. Marshall and Hurst: Practical Zoology (Smith Elder & Co.).

Reference—

1. Lull: Organic Evolution (Macmillan).

2. Metcalfe: Evolution.

3 Parker and Haswell : Text-book of Zoology (Macmillan).

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The same as those for 1932 with an addition under 'Reference', Wilder: History of the Human Body.

Geology—Subsidiary.

Mineralogy.—The more important rock-forming minerals, their composition and general physical characters and their characteristic alteration products. An elementary knowledge of crystallography is expected.

Petrology.—Origin, classification and the distinctive characters of the leading types of sedimentary, igneous and metamorphic rocks.

Physical Geology.—The general nature and relation of the main agents of geological changes, epigene and hypogene; and their action.

Structural Geology.—Elementary knowledge of rock-structures, stratification, dip, strike, outcrop, outlier, inlier, folds; faults, cleavage, joints, unconformity and overlap; surface-features as influenced by the nature and disposition of the rocks; water supply.

Statigraphical Geology:—Rocks as embodying the history of the earth; fossils, their mode of formation and value in Geology

and also in the biological sciences; the order of superposition; the geological record; its general conclusions relating to former changes in the physical features of the earth and also in the character of the organic forms; the order of succession of plant and animal life on the surface of the globe; the theory of evolution; an elementary knowledge of Indian Geology is required.

The practical examination may include the interpretation of maps and tectonic models and drawing of sections across them, of representations of scenery and also the identification and description of the more important types of minerals, rocks and fossils including models.

Candidates will be expected to show some acquaintance with field work.

Books for study :

C. Lapworth	...	Intermediate Text-book of Geology.
A. Geikie	...	Class-book of Geology.
Pirrson	...	Introduction to Geology.
Do.	...	Rocks and Rock Minerals.

Physiology—Subsidiary.

Histology of the tissues. Foods: digestion. Absorption. Respiration. Blood and lymph. Circulation. Excretion. Metabolism. Internal secretion. Neuro-muscular system. The special sense organs. Reproduction.

Practical.—Candidates will be expected to do simple experiments on nerve-muscle physiology, on the heart-beat, on the composition of foods, of urine and of the blood. They may also be required to identify microscopical preparations of tissues (not of organs).

Books for Study for B.A. & B.Sc. Deg: Examinations—

1. Bainbridge and Menzies . Essentials of Physiology (Longmans).
2. Bodansky : Introduction to Physiological Chemistry (Wiley).
3. Lewis and Bremor : Text book of Histology. (Blakiston).
4. Parsons : Fundamentals of Bio-chemistry. (Heffer).

Books for Reference—

1. Starling : Principles of Human Physiology (Churchill).
2. Macleod : Physiology and Bio-chemistry in Modern Medicine (Mosby).
3. Evans : Recent Advances in Physiology (Heffer).
4. Pryde : Recent Advances in Bio-chemistry. (Heffer).
5. Mathews : Physiological Chemistry. (Wood).
6. Aurep and Harris : Practical Physiology (Churchill).
7. Cannon ; A laboratory course in Physiology (Harvard Univy.)

8. Folin ; Laboratory Manual of Biological Chemistry (Appleton).

9. Schafer ; Experimental Physiology. (Longmans).

Mechanical Engineering.

As a Subsidiary subject only to Physics.

WITH EFFECT FROM THE EXAMINATION OF 1933.

Graphics, Machine Drawing and Strength of Materials:—More advanced than for the Intermediate with the following additions:—

Geometrical Drawing—Simple interpenetration of solids. Elementary notions of perspective. Strength of Materials—Gordon's, Rankine's and Euler's formulæ.

Heat Engines:—More advanced than for the Intermediate.

Steam-tables.—Expansive working of steam. Indicated horse power. The Indicator and Indicator diagrams. Mechanical efficiency. Entropy.

Steam Engines:—Modern types of land, marine and locomotive engines: unflow engines; steam turbines, their description and working.

Internal Combustion Engines:—Modern engines. Modern engine cycles and their applications. Types of engines with reference to available fuels, such as petrol, kerosine, crude oil, gas, (suction and pressure).

Fuels:—Characteristic properties of common fuels-coal, charcoal, wood and oils. Calorific values.

Boilers:—Description and working of common types of boilers and their accessories.

Materials:—Same as for Intermediate but more detailed.

Connections:—Same as for the Intermediate but more advanced. Efficiency of simple types of rivetted joints. Treatment of 3 or 4 overlapping plates. Connection of plates with angle and T irons. Flange joints. Different forms of screw threads. Cotter fastenings.

Shafts and bearings:—Shafts and shaft couplings. Clutches. Universal joints. Bearings for horizontal and vertical shafts. Ball and roller bearings. Methods of lubrication.

Belt and toothed gearing:—Same as for Intermediate but more advanced. Worm and helical gearing.

Engine Details:—Usual forms of cranks and levers. Methods of fixing crank pins. Forms of eccentric. Ordinary arrangements of connecting rods, Cross heads and coupling rods. Forms of cylinders, flanges and covers. Simple forms of pistons. Attach-

ment of piston rods. Simple forms of stuffing box and gland. Construction of simple slide valve.

Pumps:—Types of pumps—reciprocative and rotary. Relative advantages and applications.

PRACTICAL WORK.

The following indicates broadly the scope of the practical work.

1. More advanced exercises in wood work, forging, soldering, casting, fitting and wood and metal turning, specially with reference to scientific instruments.

2. Finding calorific values of solid, liquid and gaseous fuels.

3. Viscocity of lubricating oils by Viscometer.

4. Determination of flash points of common fuel oils.

5. Testing of engines.

(a) Taking indicator diagrams and determination of I. H. P. and B. H. P. and calculation of mechanical efficiency.

(b) Testing for fuel consumption per B. H. P. hour.

(c) Finding heat efficiency.

Note:—At least two hours a week should be devoted to practical work.

Books for Study—

Applied Mechanics—An Introduction to Applied Mechanics. E. S. Andrews—Cambridge Technical Series.

Machine Drawing & Design—Spooner.

Machine Design—Berard & Waters.

Steam and other Engines—Duncan.

Steam and Steam Engines—Jamieson.

Electrical Engineering.

As a Subsidiary subject only to Physics.

WITH EFFECT FROM THE EXAMINATION OF 1933.

1. *General principles*:—More advanced course than for the Intermediate with the following additions:—

Magnetisation curves of iron and steel. Calculation of Ampere turns in magnetic circuits of D. C. machines. Eddy currents. Hysteresis. Armature reaction. Capacity.

2. *Measurements*:—In addition to that for the Intermediate frequency meters, power factor meters, and 3 phase wattmeters.

3. *Generators*:—Continuous current generators, alternators and synchronising alternators, transformers; their characteristics and methods of testing efficiency and voltage regulation. Transformers and their uses and connections. Parallelling of generators and transformers.

4. *Motors*—Continuous current motors, synchronous and induction motors, their characteristics and uses; methods of starting. Principle of working of a rotary converter.

5. *Batteries*:—Secondary batteries and their practical applications.

6. *Power Distribution*:—Methods of distributing electric power in streets; overhead and underground mains; D. C. three wire system. A. C. three phase four wire system. Calculation of conductor sizes. Properties of insulation materials.

7. *Illumination*:—Candle power; polar curves. Use of shades and reflectors.

8. Design and management of a small house lighting power plant with storage battery.

The magneto. Any one type of an automobile lighting system.

LABORATORY COURSE.

The following indicates broadly the scope of the practical work.

Same tests as for the Intermediate with insistance on greater accuracy of results, with the following additions.

Direct Current:—

1. Calibration of ammeter against a standard instrument.

2. Calibration of a voltmeter against a standard cell with a dial type of potentiometer.

3. Measurement of hysteresis by Ewing's hysteresis tester.

4. Shunt motor. Approximate predetermination of efficiency of shunt motor at varying load currents by measurement of power taken at no load.

5. Series Motor (a) speed characteristic, (b) efficiency by a brake test.

6. Compound wound motor, (a) reversal of compound wound motors additive and differentially compounded, (b) speed characteristic, additive compound, (c) speed characteristic differentially compounded, (d) efficiency of a compound wound motor by a brake test.

7. Generators (a) separation of iron, friction and copper losses of a generator at full load (b) calculation of efficiency from losses, (c) approximate efficiency of a shunt generator by measurement of power taken when run as a motor on no load. (d) excitation characteristic of generator, (e) parallelling of 2 shunt generators and verification of sharing of load according to their separate characteristics.

8. Compound wound generators:—(a) load characteristic separately excited additive compound.

(b) load characteristic, self excited additive compound.

9. Operation of a simple electric lighting plant with charging dynamo and regulating battery.

Alternating Current:—

10. Comparison of capacity against a standard.

11. Measurement of capacity from voltage applied, frequency and resulting current.

12. Measurement of impedence (involving also capacity).

13. Efficiency of a 3 phase alternator by measurement of iron, friction and copper losses.

14. Alternators—

(a) Load characteristic of a 3 phase alternator with non-inductive load.

(b) Effect of unbalanced load.

(c) Parallelling of single and 3 phase alternators; synchronising by lamps; distribution of load between alternators.

15. Synchronous motors—

(a) Efficiency by brake test.

(b) Effect on power factor for a particular load when over and under excited.

16. Transformers:—

(a) Efficiency of single phase transformers from losses.

(b) Star and delta connections of transformers. Parallelling of single phase transformers.

(c) Efficiency and voltage regulation of transformers, connected 3 phase by actual loading and by watt-meter measurements on the primary and the secondary sides.

17. Measurement of power:—

(a) By two watt-meter method.

(b) Measurement of power factor in a 3 phase circuit.

18. Induction motor. 3 phase squirrel cage and slip ring types.

(a) Speed variation on load. Approximate slip.

(b) Efficiency from brake test.

(c) Power factor improvement on load.

(d) Effect on power factor with resistance in motor circuit.

19. Calibration of a 3 phase watt hour meter against wattmeters and standard clock.

20. Illumination—Polar curves of incandescent lamps.

21. The running of a simple electric generating plant, comprising of an engine, dynamo and storage battery.

Note:—At least two hours a week should be devoted to the laboratory course.

Books for Study—

Elementary Electrical Engineering.—Clayton and Shelley. Longmans, Green & Co., London.

Electrical Engineering—Gray-Mc Graw Hill Publishing Co., London.

GROUP (III)—PHILOSOPHY.

1931

Text-books recommended—

I. *Logic and Theory of Knowledge*—

1. Indian—Tarka Samgraha.

2. European—First 4 lectures of Bosanquet's Essentials of Logic along with Part III of Creighton's Logic.

II. *Psychology*—

R. S. Woodworth's Psychology—A study of Mental Life; Revised Edition. (Methuen).

III. *Ethics*—

Muirhead's Elements of Ethics.

IV. *Philosophical Work prescribed*—

1. European Philosophy—Berkeley's Principles of Human Knowledge.
2. Indian Philosophy—Sankhya Karikas of Iswara-Krishna.

1932.

I, II, III and IV-2—Same as for 1931.

IV. *Philosophical Work prescribed*—

1. European Philosophy—Hume's Enquiry Concerning Human Understanding.

1933

I, II & III—Same as for 1932.

IV. *Philosophical Work prescribed*—

1. European Philosophy—The Meditations of Descartes.
2. Indian Philosophy—The Vedantasara of Sadananda.

GROUP (IV-A)—HISTORY AND ECONOMICS.

SYLLABUS IN ECONOMICS.

Students will be required to show a clear understanding of economic principles by intelligent application of economic theory to Indian facts and problems.

General.—The scope of Economics. Relation of Economics to other Sciences. Methods of Economic enquiry, deductive and inductive (*e.g.*, family budgets, village and city surveys, statistics). History (in broad outline) of Economic thought.

Psychological Basis of Economics and Consumption.—Classification of Wants, Satiability. Wants in relation to activities. Elastic and Inelastic Demand. Economic meaning and types? Consumption. Conception of 'Utility' and 'Value'. Economic motive; the 'Economic Man'; influence of family system.

The Production of Wealth, Definition.—Production as (a) creation of use value, (*b*) creation of exchange value. *Classification.* Production for Producer's use (*a*) Individual, (*b*) Social, Production for the Market.

Factors of Production, Natural forces and materials, soil, sun, rain, minerals, etc. The Principle of Conservation. *Material capital* (Classification of forms, social and individual capital). *Human energies,* (*a*) physical, (*b*) intellectual. Theory of population. Efficiency dependent on (*a*) individual physique, nutrition, knowledge, skill, moral quality, (*b*) social conditions; *e.g.;* social order, co-operation and division of labour. Methods of conserving past acquisitions of skill and knowledge (*e.g.,* hereditary occupations, apprenticeship, industrial education). New acquisitions (*e.g.,* research, and invention).

Characteristics of Modern Production, Basis, (*a*) Individual Property, (*b*) *Contract.* Character (*a*) Mercantile, (*b*) Capitalistic, *Forms* (*a*) Individual (peasant and craftsman); (*b*) patronal (individual employer and joint stock company), (*c*) Co-operative, (*d*) Collectivist (state and municipal). *Specialization. Concentration* in agriculture, manufacture, transport, commerce, Horizontal and Vertical combination. *Competition and Monopoly.* Extent to which Indian industry possesses these characteristics.

Stages of Production.-Extractive Industries, Agriculture—Fishing, Forestry, Mining, etc., *Manufacture.* Laws of Diminishing Returns and Increasing Returns. Transport and *Commerce,* local, intranational and international. *Money, credit and insurance* as auxiliaries to production.

Mechanism of Exchange.—Origin and functions of money. Metallic Coinage. Functions of Banks. Fiduciary money and money substitutes (Treasury notes, bank notes, cheques, bills of exchange). The rupee, Indian Exchange.

Exchange Value.—Theory of Value, Equilibrium between Demand and Supply. Market value and normal value. 'Value of Money' meanings of phrase. Variations in value of money.

Distribution of Wealth.—The Share of Lands, Rent. Supply and Demand in relation to Land. The Ricardian Law of Rent. Economic Rent, Customary Rent, Rack-rent. The sharing of Economic rent in India.

The Share of Labour.—(a) Wages. Supply and Demand in relation to Labour. Theories of wages (*a*) Minimum subsistence. (*b*) Standard of life, (*c*) Marginal productivity. Combinations of employers and employees in relation to wages.

(*b*) *Salaries.*—Supply and Demand in relation to acquired knowledge and skill and exceptional ability.

The Share of Capital: Interest.—Supply and Demand in relation to Capital. The accumulation of capital. Conversion of capital from unspecialized to specialized forms. Interest on loanable capital. Interest on investments. Capitalization. Promotion.

The Share of Enterprise: Profits.—Supply and Demand in relation to Business Organization. Profits and the Entrepreneur.

The Share of the State: Taxation.—The community as worker and sharer in the product. Duties and Expenses of Government. Forms of Taxation. Protection and Free Trade.

(For books recommended for study—*Vide* page 108).

SYLLABUS IN POLITICAL SCIENCE.

The State.—Its characteristics and relation to kindred conceptions, *e.g.*, People, Nation, Society, Government, Constitution. Its value.

The origin of the State.—The family, patriarchal or matriarchal primitive headship; slavery or adoption, conquest or amalgamation.

The Ancient City State.—Political evolution in Sparta, Athens, Rome—Monarchy, Aristocracy, Oligarchy, Tyranny, Democracy. The Federated City State. The Imperial City State.

The Country State.—Break up of the Roman Empire—Political forces of the Middle Ages—Feudalism, the Holy Roman Empire, the Papacy, premature Constitutionalism, the reappearance of the City State.

The modern period, Political influences of the Renaissance, Reformation, Maritime Discoveries. National monarchy in England and France—resemblance and contrast in sixteenth, seventeenth and eighteenth centuries.

The Social contract.

Constitutional Monarchy. Republican Government, *e.g.*, France and U.S.A.

The Federated Country State. The Imperial Country State.

Analysis of the Modern State.—The Legislative, Executive, and Judicial powers. The principle of separation of powers (*a*) as between federal and part state organs, e.g., U.S.A., (*b*) as between the Legislature, Executive and Judiciary, e.g., U.S.A., Great Britain, France.

The Legislature.—Two Chambers—their composition and powers. The representative and the telephone theories. Direct legislation by referendum and initiative. Sovereign and non-sovereign legislature. Rigid and flexible Constitutions.

The Executive.—Parliamentary and non-parliamentary Executives. The Cabinet.

The Judiciary.—Its relation to the Executive and the Legislature. The 'rule of law.'

Party-Government.—Its development in Great Britain and the U.S.A. Its merits and defects.

The Sphere of the State.—The Greek and Roman view. Teutonic individualism.

Mercantile policy. Laissez Faire. Modern Individualism and Socialism.

The following books are recommended for study, but are not prescribed.:—

Fowler: *The City State of the Greeks and Romans.*

Sidgwick: *The Development of European Polity.*

Leacock: *Elements of Political Science.*

Low: *The Governance of England.*

GROUP (IV-B)—ECONOMICS AND HISTORY.

(1) SYLLABUS IN ECONOMICS—GENERAL.

Same Syllabus as prescribed for Group (iv-A).

Books recommended—

Marshall: Economics of Industry.

Clay: Economics for the General Reader.

Briggs: A Text-book of Economics.

Banerjee: A Study of Indian Economics.

Moreland's Introduction to Economics for Indian Students.

(2) ECONOMICS (SPECIAL PAPER.)

Part 1—Rural Economics.

Scope—A study of the organization and financing of agriculture, and in general all activities connected with rural uplift, with special reference to India. To include, in particular, co-operative systems and methods, marketing, land tenures and all kinds of State activity for Agricultural improvement.

Books recommended—

1. Carver ... Principles of Rural Economics.
2. Keatinge ... Agricultural Progress in Western India.
3. Matthai ... Agricultural Co-operation.
4. Abridged Report of the Royal Commission on Agriculture, 1928.

Part II—Public Finance.

Scope.—The raising and spending of revenues, its theory and practice; including also public debts, financial administration and the economic functions of Government. The whole to be illustrated from the recent financial history of India and England.

Books recommended—

1. Dalton ... ... Public Finance.
2. Armitage-Smith ... The Nature and Principles of Taxation.
3. Report of the Indian Taxation Enquiry Committee.

(3) MODERN ECONOMIC HISTORY OF ENGLAND AND INDIA.

A general survey of the agricultural, manufacturing and commercial developments in England and India from 1600, special attention being paid to the period after the Industrial Revolution in England and that after 1848 in India. The following lines of development should specially be kept in view:—The economic policy of the State, changes in agricultural and industrial methods and organization, transport methods and trade developments, changes in the structure and control of business, tariff policies, growth of banks and financial systems, labour movements and social changes.

Books recommended—

1. Ashley ... ... Economic Organization of England.
2. Worts ... ... Modern Industrial History.
3. Gadgil ... ... The Industrial Evolution of India.
4. Knowles ... ... Industrial and Commercial Revolutions in the 19th century.
5. Slater ... ... The Making of Modern England.
6. Imperial Gazetteer, Vol. III.

(4) POLITICAL SCIENCE.

The same as for Group (IV-a).

GROUP (V)—LANGUAGES OTHER THAN ENGLISH.

(1) SANSKRIT.

(*a*) *Main.*

Sanskrit Language and Literature. The course shall be:—

(*a*) Selections from the Early Period, including Vedic Mantras, Brāhmaṇas, Āraṇyakas and Upanishads and the Sūtra literature.

(*b*) Selections in prose and verse from the Later Period, including the Dharmaśāstras, and the Itihāsa, Kāvya and Nataka literature.

A knowledge of Alamkara-śastra will be required sufficient for the correct understanding of native commentators.

(*c*) Sanskrit Grammar treated historically and comparatively in accordance with a syllabus.

(*d*) Translation from and into Sanskrit.

(*e*) General History of Sanskrit Literature.

(*f*) Early Indian History.

In the examination there shall be two papers, each of three hours' duration in subject (*b*) and one paper of three hours' duration in each of the other subjects, except Translation which will form part of the papers set on (*a*) and (*b*) above.

(*b*) *Subsidiary.*

The course shall consist of the study of one drama of the classical period and portions of one Kavya. In the examination there shall be one paper of three hours' duration which shall include pieces for translation from Sanskrit into the main language.

SYLLABUS FOR SANSKRIT GRAMMAR FOR GROUP (v)—LANGUAGES OTHER THAN ENGLISH.

The following syllabus for Sanskrit Grammar treated historically and comparatively has been approved.

Syllabus for Indo-European Philology with special reference to Sanskrit.

N.B.—Knowledge, accurate, so far as it goes, but neither extensive nor minutely detailed, is expected under each head.

P.I.E. = Primitive Indo-European; Ind.-Ir = Indo-Iranian; Skt.=Sanskrit; Gk.=Greek; Lat.=Latin; Teut.=Teutonic.

A. GENERAL.

I. *Elementary Phonetics.*—(*a*) The organs of speech—production and classification of speech-sounds. Quantity; accent.—sentence-, word-, and syllable accent. Glides.

(*b*) Phonetic description of all speech-sounds treated in the course. Phonetic transcription.

(c) Sound-change; isolative, conditional; defective imitation and the result of analogy. Meaning of the term 'Law' in Linguistic Science. Dialectal separation. Growth of 'literary' languages. Families of languages. Cognate words and loan words.

II. *The Indo-European Family of Languages.*—The original speech and its earliest dialectal divisions. Branches and sub-branches of the Indo-European Family. Some distinguishing characteristics of the Indo-Iranian, Hellenic, Italic, and Teutonic branches.

III. *Indo-Iranian.*—The Indian Sub-Branch. Dialects of Vedic times. Epic dialects. Classical Sanskrit. Middle Indian Speeches. New Indian Speeches.

B. PHONOLOGY.

IV. *The P.I.E. vowel system.*—The oldest conditions: primary vowels: changes resultant on accent: secondary vowels and syllabic liquids and nasals. Vowel-gradation, quantitative and qualitative; its relation to accent and its bearing on morphology. The later P.I.E. vowel-system prior to the period of languages separation. General treatment of the P.I.E. vowel-system in the oldest Ind-Ir., Gk., Lat., and Teut.

V. The vowel-system of Skt. in its relation to P.I.E. and to the vowel-systems mentioned in IV. Vowel-gradation in Skt.

VI. *The P.I.E. Consonant system.* Classification of the P.I.E. consonants. Earliest dialectal variations; the 'centum' and 's'atam' divisions. Treatment of the P.I.E. consonant generally in Ind.-Ir., Gk., Lat. and Tuet.

VII. Representation of the P.I.E. consonant-system in Skt. liquids and nasals. Plosive consonants. Cerebral consonants (Fortunatov's Law). Palatal and velar consonants. (The law of palatalization.) The law of aspirates (Grassmann's Law), Spirants, Semi-vowels.

VIII. Sandhi, external and internal. Glides in Skt. Anaptyxis (Svarabhakti). Haplology.

C. ACCIDENCE.

IX. Word-formation. Base, stem and suffix. Prefix-Infix.

X. Skt. compounds, nominal and verbal.

XI. Skt. suffixes, primary (kṛt) and secondary (taddhita).

XII. *Nominal Declension.*—P.I.E. conditions. Number. Grammatical Gender. Case and case-endings. P.I.E. case-endings. Syncretism. Contamination. Classification of noun declensions according to suffix. Vowel and consonant-stems.

XIII. *The noun declensions in Skt.* treated historically and comparatively with reference to P.I.E. Gk., Lat. and Teut. Philological explanation of all case-endings. Comparison of adjectives and formation of adverbs treated philologically.

XIV. *Numerals.*—Philological treatment of the Skt. numerals.

XV. *Pronouns and pronominal adjectives.*—The Skt. pronouns and pronominal adjectives treated philologically with reference to P.I.E., Gk., Lat. and Teut.

XVI. *The Verb.*—The P.I.E. verbal-system generally treated; voice, mood, tense, augment, reduplication, personal endings. Thematic and Athematic stems. Types of verbal action.

XVII. The Skt. verb in its relation to the P. I. E., verbal system. Present, perfect, aorist and future systems in Skt. Transfer from the athematic to the thematic class. Periphrastic formations. Analogy in the Skt. verbal-system. Derivative verbs—causative, denominative, desiderative, intensive.

XVIII. Voices, moods and tenses in Skt. Infinitive verbal formations.

(2) TAMIL, TELUGU, KANARESE OR MALAYALAM.

The course shall be:—

(*a*) The study of selections representative of the several periods of the literature of the selected language including inscriptions.

(*b*) The history of the Language and Literature with special reference to the selected books.

(*c*) The elements of the Grammar of the language including those of the Prosody and Rhetoric of the language.

(*d*) The elements of the Comparative Grammar of the Dravidian Languages.

(*e*) Composition generally on literary and historical subjects, relating to the language chosen;

(*f*) Early South Indian History (or Language).

(*a*) SYLLABUS FOR THE COMPARATIVE GRAMMAR OF THE DRAVIDIAN LANGUAGES FOR GROUP (v).

I. *Introductory.*—The origin of language. Classification of languages. Dialectal separation and growth of literary standard languages. Dialects and Cognate languages.

II. *Introductory* (continued).—The Dravidian group of languages and their chief characteristics. Reasons for choosing the word 'Dravidian' as name of this group. Enumeration of Dravidian languages. Meaning of the names 'Tamil,' 'Telugu,' 'Kanarese' and 'Malayalam.' Where they are spoken.

III. *Introductory* (continued).—Relation between Dravidian languages and Sanskrit. Dravidian element in North Indian vernaculars. Affiliation of Dravidian languages to the Scythian Group. Tamil, the most primitive of Dravidian languages.

IV. *Phonetics.*—Production and classification of speech sounds. Sound changes and their causes. Sounds and symbols. Conditions of a good orthography.

V. *Dravidian alphabets.*—Their history. Differences among existing alphabets. Their adequacy and inadequacy.

Comparison of Dravidian sounds with Sanskrit and English sounds.

VI. *Dravidian Phonology.*—The primitive Dravidian parent language—

(1) Vowel-system.—Changes. Accent. Harmonic sequence of vowels.

(2) System of consonants.—Origin of cerebrals. Dialectic interchange of consonants. Euphonic permutation of consonants. Sandhi. Nasalization. Anusvara and Ardhanusvara. Prevention of hiatus.

(3) Dravidian syllabation.

VII. *Roots.*—Dravidian roots arranged into two classes. verbal roots. Nouns. Lengthening of roots. Formative addition to roots.

VIII. *Accidence*: (1) *The Noun*—

(*a*) Gender—Dravidian nouns divided into two classes denoting rational beings and irrational things except in Telugu in which they are classified as Mahat and Amahat, the latter including words denoting women. Comparison between Dravidian languages on the one hand and Sanskrit and English on the other.

(*b*) Number.—Singular and plural. No dual. Singular. Masculine, feminine and neuter. Plural-principles of pluralization.

(*c*) Case.—Principles of case-formation. Dravidian cases.

(2) *The Adjectives.*—Their agreement with substantives like those in Sanskrit. Formation of Dravidian adjectives from Sanskrit derivatives. Formation of adjectives from substantives, relative participles of verbs and past verbal participles. Comparison of adjectives.

(3) *The Numerals.*—Different views about their origin. The cardinals and ordinals. The neuter noun of number and the numerical adjective.

(4) *The Pronouns.*—Light thrown by pronouns on relationship of languages. Persistence of personal pronouns. Pronouns of the first person singular. Comparison of dialects. Analogies. Pronouns of the second person singular. Comparison of dialects. The reflexive pronoun. Pluralization of the personal and reflexive pronoun. Demonstrative and interrogative pronouns. Demonstrative cases. Interrogative cases. Demonstrative and interrogative adjectives. Demons-

trative and interrogative adverbs. Honorific demonstrative pronouns.

(5) *The Verbs.*—Structure of the Dravidian verb. Roots used either as verbs or nouns. Formative particles often added to roots. Classification of verbs into transitive and intransitive. Ways in which intransitive verbs change into transitive. Sanskrit analogies.

(*a*) Causal verb—Causals formed from transitives. Origin of Dravidian causal particle.

(b) Frequentative verbs.

(*c*) Conjugational system.—Formation of the tenses. Verbal participles. Their signification and force. The present tense and its formation. The preterite tense and its formation. The future tense. The future formation in Dravidian languages. The relative participle.

(*d*) Formation of Moods.—Methods of forming the conditional, the imperative and the infinitive; origin of the infinitive suffix.

(*e*) The Voice—Active and passive—The negative voice. Combination of negative particles with verbal themes. The Dravidian negative particle.

(*f*) Formation of verbal nouns, derivative nouns and abstract nouns.

(6) *Adverbs.*

IX. *Vocabulary.*—I. Borrowing and its causes. Social, commercial, political and religious. Borrowings from Sanskrit, borrowings from other languages.

2. *Structure and form.*—The essentials for the individuality of a language. Vocabulary cannot change the character of a language. Hybrids. Gain and loss from mixed character of a language.

X. *Comparative Syntax.*—The syntax of the several languages compared. Differences and similarities. The extent of Sanskrit influence over the syntax of the several languages.

(*b*) SYLLABUS FOR THE HISTORY OF THE TAMIL LANGUAGE.

I. *General.*—The origin and meaning of the word "Tamil". The place of Tamil in the Dravidian family of languages, its high antiquity, the geographical area where it was spoken in

ancient times as referred to by old commentators, the twelve Sen-Tamil and the twelve Kodum-Tamil countries. Very early cultivation of Tamil as a literary language; the three Sangams how far historical; Agastyar; his contribution to Tamil. Tolkappiyam: its importance for the study of the language. The extent of Sanskrit influence on Tamil Grammar.

II. *The periods of Tamil language.*—(1) The old or Sangam Tamil, (2) the mediaeval Tamil and (3) the modern Tamil. Illustrative literature of each period. Grammars of the different periods: Tolkāppiyam, Virasōliyam and Nannūl. The difference between the language of the different periods in point of vocabulary and grammar.

III. *Language and Dialect.*—The standard or literary language and the spoken language, their relation and mutual influence. The difference between the two. Sen-Tamil. Kodum-Tamil. Iyal, Isai, Nātakam Tamils. Dialects: how formed. Different localities and different classes of people in the same locality have different dialects. Are dialects discernible in ancient literary works?

IV. *The Alphabet.*—(*a*) *The Script.*—its gradual development. Vatteluttu, the grantha-Tamil characters, their geographical distribution, origin and history. The relation of Vatteluttu and grantha-Tamil characters to Brahmi. The form of Tamil characters how far determinable from Tolkāppiyam and the other grammars and commentaries thereon. The dotted e and o. Gradual changes in script. Changes credited to Beschi. (*b*) *The sound values.* How far the alphabet is phonetic. Its pronunciation, the spoken sounds, and the written symbols.

V. *Phonology.*—Vowels and their relation to the primitive Dravidian vowel-system. Classification of vowels according to the place of production. Diphthongs. Accent and emphasis, accent determining change, *eduttal* (rising accent), *paduttal* (falling accent), *nalital* (level or vanishing accent). The influence of accent on word-change and in prosody: alapedai. Mutation of vowels. Vowel harmony. Vowel sandhi—glides.

VI. *Phonology* (continued).—Consonants and their relation to the primitive Dravidian consonants, classification of consonants according to the place of production. History of consonantal sounds, palatalization, dentalisation, voicing, unvoicing, consonant length. Assimilation. Consonantal alapedai. Dialectal interchange of consonants. Consonantal sandhi. Laws of Tamil syllabation, the initial, the medial, the final letters in a word, the difference between Tolkappiyam and Nannūl on this point. The light thrown by the rules of syllabation on the nature of loan words.

VII. *Accidence.*—(1) *Nouns.*—Gender and number; how mutually expressive and interdependent. Are Dravidian nouns naturally neuter? Gender prefixes and suffixes, the epicene plural as distinguished from the Neuter plural, the neuter plural

suffixes, double plurals, gender and number treatment, how they differ in old and modern Tamil. (2) *Case*, the number of cases and Sanskrit influence, the formation of the oblique case, the inflexional base, the inflexional increments or augments, their varied uses, the suffixes of the various cases, their probable origin and history. The uses of the various cases. Old Tamil, modern Tamil, how they differ in the formation of cases.

VIII. *Accidence* (continued)—*The Pronouns.*—Their form in old and modern Tamil, the three persons and their plural forms, the oblique forms of the pronouns, the phonetic relationship between the oblique and the substantive forms of the pronouns. The reflexive pronouns, the demonstrative and the interrogative cases, old and modern forms. Honorific pronouns.

IX. *Accidence* (continued)—(1) *The Verbs.*—The structure of the verbs, the base, the tense infix and the pronominal suffix, classification of verbs into tan-vinai and pira-vinai. How far this classification is synonymous with 'transitive' and 'intransitive,' the causals, the modes of forming the causals and the transitives. The various causal suffixes, reduplication. Appellative verbs. (2) The passive voice, the history of *padu*, the different modes of expressing the passive significance and of negative particles in old and modern Tamil. (3) The imperative form of the verb, how the infinitive is formed, the various suffixes in old and modern Tamil. The subjunctive, how expressed in old and modern Tamil. (4) The Tenses;—the tense infixes (*idainilai*, the present, the preterite, and the future). Is there no reference to the present tense in the Tolkāppiyam? The difference between the old and modern Tamil as regards the tense formation. *Kirukinru*, *t*, *t*, *r*, and *in*; and p. and v. their history, phonetic relationship, etc., and the principles of their use. (5) The relative and the verbal participles, the suffixes forming them.

X. *Accidence* (continued) *The Adjectives and the Adverbs* (*uriccol*).—The adjectival and the adverbial participles, their origin and history. *The numerals.* The cardinals and the ordinals and the multiplicatives, the numeral bases mainly adjectival in nature, formation of substantive numerals from the base, the principles of formation. The double forms such as ir and ir, mu and mu, etc., their uses and the laws governing them. The light thrown by the numerals on the antiquity of Tamil. *The particles* (idaiccol), their origin and significance. (Interjections) and conjunctive particles.

XI. *Vocabulary.*—The general character of the Tamil vocabulary at different periods, the so-called pure Tamil. Borrowing, its causes. Periods of borrowing, character, comparative extent of borrowing at each period. Doublets, Telugu and Kanarese element, causes of admixture, various periods of entry of Telugu and Kanarese words into Tamil. Loss of old words. Nature and extent.

XII. *Vocabulary* (continued).—Sanskrit words; Tatsamas: Samskritasamas and Prakritasamas. Laws of formation. Tadbhavas, Samskritabhavas and Prakritabhavas. Laws of formation. Period of extensive Prakrita borrowing. Other borrowings, Hindi, Portuguese, English, etc., Manipravala style. Hybrids, Tests for distinguishing loan words.

XIII. *Word-building in Tamil.*—(1) By composition, compound words like *kadu-vay*, etc. Several kinds of compounds or *tokai*:—*ummai* and *uvamai*, etc. (2) By derivation, the various suffixes used to form nouns, verbs, adjectives and adverbs, etc. (3) Root-creation, bank formation, double bases like *nal, nan*, etc. Old and modern Tamil compared as regards the capacity to form new words and also the method of forming the words.

XIV. *Semantics.*—Changes in the meaning and usage. Elevation, degradation, specialisation and generalisation of native and foreign words.

XV. *Syntax.*—Order of words in a sentence. The difference between Poetry and Prose as regards syntax. Deviations from the normal order of words in a sentence and their causes. Sanskritic constructions in Tamil.

(c) SYLLABUS FOR THE HISTORY OF THE TELUGU LANGUAGE.

I. *General.*—The origin and meaning of the word 'Telugu', The place of Telugu in the Dravidian family of languages. Its antiquity and its geographical distribution. Period of its early cultivation as inferred from the inscriptions. The extent of Sanskrit influence over Telugu Grammar.

II. *Periods of Telugu Language.*—The pre-Nannayya period, the Nannayya period, and the post-Nannayya period. Illustrative literature of each period. Grammar of each period. Difference between languages of different periods in point of vocabulary and grammar.

III. *Language and Dialect.*—The standard of literary language and the spoken language. Their relation and mutual influence. Dialects. How formed? Different localities and different classes of people in the same locality have different dialects. Are dialects discernible in ancient literary works?

IV. *Telugu Alphabet*—

(*a*) *The Script.*—Its gradual development. The Telugu-Kanarese form and its relation to Brahmi, Vengi and Chalukya scripts.

(*b*) *The sound-values.*—How far the alphabet is phonetic. Its pronunciation. The spoken sounds and the written symbols.

V. *Phonology.*—Vowels and their relation to the primitive Dravidian vowel-system. Classification of vowels according to the place of production. Diphthongs. Accent and emphasis. Accent determining change. Mutation of vowels. Vowel harmony, vowel sandhi.

VI. *Phonology* (continued).—Consonants and their relation to the primitive Dravidian consonants. Classification of Telugu consonants according to the place of production. Consonantal diphthongs. Mutation of consonants. Assimilation of consonants and consonantal sandhi. Other changes in consonants. Palatalization, Dentalization, Voicing, Unvoicing, Compensatory length, etc. The theory of ardhanusvara and the cacuminal Dialectic interchange of consonants. Telugu syllabation.

VII. *Accidence.*—Nouns. Gender. Nouns denoting *mahat* and *amahat.* Number. No dual. Principles of pluralization. Different treatment of *tatsama* and *accika* words with regard to the formation of number and gender. Case and case-endings. Principles of case formation. Aupavibhaktikas.

VIII. Accidence (continued).—Adjectives. Classification of adjectives. Their agreement with substantives. Formation of adjectives from substantives. Comparison of adjectives.

IX. *Accidence* (continued).—Numerals. Ordinals and cardinals. Declension of numerals.

X. *Accidence* (continued).—Pronouns, Classification of pronouns. Declension of pronouns. History of the Telugu pronouns. Demonstrative and interrogative adjectives. Demonstrative and interrogative adverbs. Honorific demonstrative pronouns.

XI. *Accidence* (continued).—The verb. Structure of the verb. Causal verbs. Atmanepada verbs: Voice: Active and passive. Tenses, present, past and future. Moods, conditional, imperative, infinitive and negative. Formation of verbal participles, verbal nouns, derivative nouns, and abstract nouns.

XII. *Accidence* (continued).—Adverbs. No real adverbs in Telugu.

XIII. *Vocabulary.*—General character of the Telugu vocabulary. The native element. The so-called *acca*-Telugu. Borrowing and its causes. Formation of compounds. Coining doublets. Dravidian basic element. Tamil and Kanarese element. Causes of admixture. Various periods of entry of Tamil and Kanarese words into Telugu.

XIV. *Vocabulary* (continued).—*Tatsama* words. *Samskritasama* and *Prakritasama.* Laws of formation. Period of extensive Prakrit borrowing. *Tadbhava* words. *Samskritabhava* and *Prakritabhava.* Laws of formation. Other borrowings. Hindustani, Marathi, Oriya, English, French; etc.

XV. *Word-Building.*—(1) By composition. (2) By derivation. The various suffixes used to form nouns, verbs, adjectives and adverbs, etc. (3) Root-creation.

XVI. *Semantics.*—Changes in meaning and usage. Elevation and degradation. Specialization and generalization of native and foreign words. Obsolete words.

XVII.—*Syntax.*—Order of words in a sentence. The difference between Prose and Poetry as regards syntax. Deviations from the normal order of words in a sentence and their causes. Sanskritic constructions in Telugu.

(*d*) SYLLABUS FOR THE HISTORY OF THE KANARESE LANGUAGE.

I. *General.*—The origin and meaning of the word 'Kanarese.' The place of 'Kanarese' in the Dravidian family of languages. Its high antiquity and its geographical distribution. Period of its early cultivation as inferred from the inscriptions. The extent of influence of Tamil, Telugu, Malayalam and Marathi, etc., if any, and of Sanskrit over Kanarese grammar.

II. *The Periods of Kanarese Language*—

(1) The period of the written ancient dialect.

(2) The period of the mediæval dialect.

(3) The period of the modern dialect.

Illustrative literature of each period. Grammar of each period. Difference between the languages of different periods in point of vocabulary and grammar.

III. *Language and Dialect.*—The standard of literary language and the spoken language. Their relation and mutual influence. Dialects, how formed. Different localities and different dialects. Badaga, how an ancient Kanarese dialect. Are dialects discernible in ancient literary works?

IV. *Kanarese Alphabet*—

(a) *The Script*—The Kanarese alphabet a variety of the so-called Cave-character. Its gradual development. The Telugu-Kanarese form and its relation to Brahmi, Vengi and Chalukya scripts, and the script of the *sasanas* of Cochin.

(b) *The sound-values.*—Unlike the Tamil and Malayalam alphabet, the alphabet is perfectly phonetic. The spoken sounds and the written symbols.

V. *Phonology*—Vowel system.—Vowels in Accagannada and those borrowed from Sanskrit. Vowels and their relation to primitive Dravidian vowel system. Classification of vowels according to the place of production. Diphthongs. History of the vowel sounds. Accent and emphasis. Accent determining

change. Mutation of vowels. Vowel harmony. Vowel-sandhi, glides.

VI. *Phonology* (continued)—Consonant system.—Consonants in Accagannada and those borrowed from Sanskrit. Consonants and their relation to the primitive Dravidian consonants. Classification of consonants according to the place of production. Consonantal diphthongs. Mutation of consonants. Assimilation of consonants and consonantal sandhis. History of consonantal sounds, doubling of consonants, palatalization, dentalization, voicing, unvoicing, compensatory lengthening, nasalization, denasalization, etc. Dialectic change of consonants. Theory of Kula and Ksala L's and the history of *r* and *l*. Kanarese syllabation.

VII. *Accidence.*—Nouns. (1) Gender. Are Dravidian nouns naturally neuter? Nine genders according to the grammarian Kēsirāja, reducible however to three, masculine, feminine, and neuter. Gender prefixes and suffixes. Gender in metaphorical diction etc.

(*b*) Number. Words plural in form, but with a dual signification. Principles of pluralization. The epicene plural, the neuter plural, double plurals. Gender and noun treatment, how they differ in old, mediæval and modern Kanarese.

(2) Cases and case-endings in old, mediæval and modern Kanarese. Percilinds of case-formation.

VIII. *Accidence* (continued).—Adjectives or attributive nouns (gunavacanas). Classification of adjectives. Formation of adjectives. Their gender and agreement with substantives. Ordinary nouns and pronominal nouns used as adjectives. Adjectives used as adverbs. Comparison of adjectives.

IX. *Accidence* (continued).—Numerals. The cardinals and the ordinals, the multiplicatives, appellative nouns of number in Kanarese and the history and principles of their formation.

X. *Accidence* (continued).—Pronouns. Classification of pronouns. Their forms in the dialects of Kanarese. Declension of pronouns. History of pronouns. Reflexive pronouns, demonstrative and interrogative pronouns.

XI. *Accidence* (continued).—Verb. I. Structure of the verb. The base. the tense suffixes. Classification of verbs into transitive and intransitive, though felt was not mentioned by Kesiraja and Nagavarma, but introduced by Bhattakalanka about 400 years later. The modes of forming the causals and the transitive.

2. The passive voice. The different modes of expressing the passive significance.

3. The various modes of expressing the negative significance.

4. The imperative form of the verb, the infinitive.

5. No moods in Kanarese—the conditional or the subjunctive, how expressed.

6. The primary tenses—the present, the preterite and the future. The history of their formation and their uses.

7. Other compound tenses, such as continuative perfect, imperfect future, perfect future, perfect, etc., though not specified in ancient grammars, how expressed.

8. Formation of the verbal participles, verbal nouns, derivative nouns and abstract nouns.

9. The various modes of expressing the English auxiliaries in Kanarese.

10. The frequentative or iterative verbs in Kanarese, but a kind of such verbs formed by simple (yugalōccārana) or triple repetition (triprayoga).

XII. *Accidence* (continued).—Adverbs, the different modes of their formation and their history.

Conjunctives and their history.

XIII. *Vocabulary*.—General character of the Kanarese vocabulary. The so-called Accagannada. Borrowing and its causes. Periods of borrowing, character and comparative extent of borrowing at each period. Hindustani, Marathi, English and Portuguese element. Loss of old words. Nature and extent.

XIV. *Vocabulary* (continued).—Samasamskrita words, tatsama words, tadbhavas, or apabhramsas, laws of formation.

XV. *Word-Building*.—(1) By composition. (2) By derivation. The various suffixes used to form nouns, verbs, adjectives, and adverbs, etc. (3) Root-creation.

XVI. *Semantics*.—Changes in meaning and usage. Elevation, degradation, specialization and generalization of native and foreign words.

XVII. *Syntax*.—1. Order of words in a sentence. The difference between Prose and Poetry as regards Syntax. Deviation from the normal order of words in a sentence and their cases.

2. The different kinds of karaka or the relation of the noun to the verb.

3. The uses of the cases.

4. The uses of the singular for the plural and *vice versa* of nouns, pronouns and verbs in a sentence.

5. Use of the singular and plural of Samskrita adjectives and their agreement with nouns.

(c) SYLLABUS FOR THE HISTORY OF THE MALAYALAM LANGUAGE.

I. *General.*—The origin and meaning of the word Malayalam. The place of Malayalam in the Dravidian family of languages. Its age and the geographical area where it has been in use. Kerala and its peculiar geographical position which brought about the development of Malayalam as a separate language. The beginning of the cultivation of Malayalam as a literary language. Earliest available works such as Ramacharitram, their importance for the historical study of the language.

II. *The periods of Malayalam language.*—Ancient, mediæval and modern characteristics of the language. Illustrative literature of each period and difference in point of grammar and vocabulary.

III. *Language and dialect.*—The standard of literary language and the spoken language. Their relation and mutual influence. The extent of Sanskrit influence on vocabulary and grammar. Dialects; How formed? Different localities and different classes of people in the same locality have different dialects. Are dialects discernible in old literary works?

IV. *The Alphabet.*—(a) The Script; its development. Ancient Vatteluttu, modern Arya-eluttu, history of the two scripts. Arya-eluttu and the consequent introduction of Sanskrit pronunciation. Changes in spelling consequent on the transcription of Vatteluttu into Arya-eluttu. (b) *The sound-values,* how far the alphabet is phonetic; its pronunciation: the spoken sounds and the written symbols. Causes of the differences in pronunciation and spelling in modern Malayalam. Spelling reform. Words spelt variously. Need for amplifying the Arya-eluttu so as to facilitate the presentation of English sounds in Malayalam. Difference between ancient and modern pronunciation.

V. *Phonology.*—(a) 1. Vowels and their relation to primitive Dravidian vowel systems. Classification of vowels according to the place of production. Diphthongs. Interchange of short vowels in Malayalam and other cognate languages. Long vowels mostly secondary. (b) Consonants and their relation to primitive Dravidian consonants. Classification of consonants according to the place of production. History of consonantal sounds, palatalization, dentalization, voicing, unvoicing. Consonant, length, Assimilation. Interchange of consonants in Dravidian languages: (*a*) palatals for gutturals and dentals; (*b*) linguals for dentals, etc. Conjunct consonants how formed; the part played by them in word-building.

VI. *Accidence.*—Nouns (1) Nominal bases—primitive and derivative, noun-compounds, ancient and modern. Inflection of nouns for gender, number and case. *Origin of gender* in Dravidian: Co-ordination of nouns and demonstrative pronouns: instances where these pronouns are used to denote gender. Changes of the demonstrative pronouns when used as terminations; (*a*) masculine (*b*) feminine (*c*) neuter. Are Dravidian nouns naturally neuter? Gender prefixes and suffixes. Poetic gender. Result of personification—based on Sanskrit usage. Concord of qualifying adjuncts (attributes) and qualified words. *Number:* Suffixes ar, ir, or, mur, etc., *Kal* the most ancient plural Suffix—its changes. Difference in the use of plural forms. Honorific and epicene plurals. Double plurals kalviar, kanniar, avargal, exceptional forms of plural nouns always used in the plural. *Case,* the number of cases and Sanskrit influence; the formation of the oblique case; the inflexional base; cases formed by suffixes and cases formed by agglutination. *Gatis,* their origin and history. Functions of cases and their significance. Metaplastic forms.

VII. *Accidence* (continued). *The Pronouns.*—Personal, demonstrative and interrogative; the last used as relative pronouns. The age of pronouns in the language. Their forms in old and modern Malayalam. Comparison of Dravidian pronouns. Honorific pronouns.

VIII. *Accidence* (continued). *The Verbs* (1) The structure of the verbs; the base; formative particles added to roots. Classification of primitive roots according to (1) form—strong and weak; (2) the sense—(*a*) Transitive, (*b*) Intransitive; (*c*) Reflexive or Neuter; (*d*) verbs whose agents do not come in the nominative case. Classification of secondary roots: (*a*) Transitive verbs derived from Intransitive and Neuter verbs; (*b*) Causal verbs derived from Intransitive and Transitive verbs; (*c*) Demonstrative verbs; (*d*) Frequentative verbs.

Finite Verbs. Tenses—suffixes—personal terminations—origin of each; loss of personal terminations. Compound tenses. *Moods*—How the imperative is formed; How the infinitive is formed; Indicative, Optative, and Potential moods. *Voices:* Is there passive voice in Dravidian Languages? Devices for denoting the idea of the passive voice; the history of *pedu negative verbs*: the growing disuse of the negative tenses.

Infinitive Verbs.—Double parts of speech, incapable of serving as a complete predicate in a sentence. Verbal nouns and nouns of agency. Participles qualifying nouns as adjectives. Participles modifying verbs as adverbs.

IX. *Vocabulary.*—The general character of the Malayalam vocabulary at different periods. Indigenous words, cognate words—Tatsamas and Tadbhavas and causes of the latter. Borrowing—periods and causes of the borrowing; the purposes for

which foreign words were borrowed. Loss of old words—nature and extent.

X. *Word-building in Malayalam*—(1) by composition—Several kinds of compounds; (2) by derivation; The various suffixes used to form nouns, verbs, adjectives, adverbs; (3) Root-creation.

XI. *Semantics*—Changes in the meanings and usage. Elevation, degradation, specialization and generalization of native and foreign words.

XII. Syntax—Order of words in a sentence—the difference between Prose and Poetry as regards syntax. Special deviation from the normal order of words in a sentence and their causes. Sanskritic constructions in Malayalam.

(3) RELATED SUBJECT: THE DRAVIDIAN LANGUAGES: SYLLABUS FOR EARLY SOUTH INDIAN HISTORY.

I. *Geographical divisions, etc., of India.*—India, south of the Vindhyas; Mahismati, the recognised point of separation between the north and the south; Dakhan and South India; Krishna the dividing line.

II. *Early inhabitants and their civilization.* etc.—Primitive inhabitants, their civilization and culture; the Aryan expansion southwards; knowledge of South India in Early Indian literature, Sanskrit and Pali; story of Agastya and his disciples; beginnings of Tamil literature.

III. *Cis-Vindhyan India in the Mauryan age.*—The Dakhan and South India in the Mauryan age; extent of Asoka's empire and his relations with South India; the rise of the Andhras; Kharavela and Kalinga; South India and Ceylon.

IV. *The Andhras of the Dakhan.*—The Andhras, their original home; their early history; Andhras in the Puranas; the later Andhras; the extent of the empire and its divisions; religion, literature, etc., under the Andhras; break up of the Andhra empire.

V. *South India in the early centuries of the Christian Era.*—South India at the dawn of the Christian era; political divisions of South India; contact with the outside world; commerce and colonization; Tamil literature of the period and its character.

VI. *The Pallavas and connected dynasties.*—The Pallavas and the Tondaiyar; Tondamandalam and its reclamation; Tondamandalam Tiraiyan of Kanchi; Satavahana expansion southwards; the Early Pallavas and their origin; their relation to the Andhras and the Tamil rulers of the South; the history of the Early Pallavas; the invasion of Samudragupta; the further his-

tory of the Early Pallavas; Kadambas, Gangas, and other minor dynasties and their relation to the Pallavas; Pallava supremacy in South India: Pallava culture.

VII. *Cis-Vindhyan-India in the age of the Guptas.*—Feudatories of the Andhras; the Chutus, the Abhiras, etc.; the Vidhyakas, the Vishnukundins, the Salankayanas, etc.; the Vakatakas; their rise and early expansion; the character of Samudragupta's southern invasion; the Vakatakas and the Guptas; continuance of Vakataka rule.

VIII. *The Pallava ascendancy in South India.*—Pallava ascendancy in South India; the great Pallavas of the Simhavishnu line; the extension of Pallava authority into the Chola country; the Pallava-Chalukya struggle; check to the Chalukya advance in the south under Pulakesin; the continuation of the struggle: overthrow of the Simhavishnu line by Nandivarman Pallavamalla; literature, art, etc., during the period.

IX. *The Chalukyas of Badami.*—The Early Chalukyas; Chalukya expansion under Pulakesin; check to Harsha's Imperial expansion; foundation of the kingdom of the Eastern Chalukyas; the successors of Pulakesin II; Chalukya overthrow by the Rashtrakutas; the general condition of the Chalukya kingdom: Hiuen-Thsang.

X *The later Pallavas and the Pallava-Pandya Struggle.*—Later Pallavas; Nandivarman Pallavamalla; restoration of Pallava ascendancy. The Pallava-Pandya struggle; the Pallavas and the Rashtrakutas; the rise of the Gangas; the Gangas as Rashtrakuta feudatories; Dantivarman; Nandivarman of Tellaru; Nripatunga and Aparajita; the end of the Pallava ascendancy and the rise of the Cholas.

XI. *The Rashtrakuta Ascendancy.*—The Rashtrakutas; Dantidurga and the Pallavas; Krishna I, Dhruva and the Gangas; Govinda III; the expansion of the Rashtrakuta power; relation with the Gurjaras and of the Palas and the Eastern Chalukyas; the greatest expansion of the Rashtrakuta power under Amoghavarsha; the Gujarati branch of the Rashtrakuta; Krishna II; Krishna III; successors of Krishna III; Rashtrakutas and Paramaras; the supersession of the Rashtrakutas by the Chalukyas.

XII. *The Eastern Chalukyas.*—Eastern Chalukyas; change of relationship with the accession of the Rashtrakutas to power; Vijayaditya II; assertion of the Rashtrakuta ascendency under Govinda III and Amoghavarsha; relation between the Eastern Chalukyas and the Pallavas; internal dissensions; Chola intervention; Rajaraja II of the Eastern Chalukyas.

XIII. *The Chola Ascendancy in South India.*—The rise of the Cholas; the Pallava-Pandya wars; Vijayalaya; Aditya;

Parantaka, the founder of the greatness of the Cholas; the Chola-Rashtrakuta struggle; Rajaraja the Great; Rajaraja; his relations with the Eastern Chalukyas; Rajendra and the expansion of the Chola empire; his invasions of Northern India and across the seas; the Chola-Pandya war in the second half of the twelfth century; Ceylonese intervention; Kulottunga III; and the reassertion of Chola authority over the Pandyas; the revival of the Pandya power; the last Cholas; the Hoysala intervention; the establishment of the Pandya ascendancy; end of the Cholas.

XIV. *The Chalukyas of Kalyani.*—The later Chalukyas; the overthrow of the Rashtrakutas; the Chola conquest of Gangavadi and its results: the first wars of the Chalukyas against the Cholas; the Raichur Doab, the bone of contention; Somesvara Ahavamalla and the successors of Rajendra I; relation between the Eastern and the Western Chalukyas: Chola-Chalukya wars under Somesvara II and the early years of Vikramaditya; Vikramaditya VI; the condition of his empire; the successors of Vikramaditya; the rise of the feudatory states; the Kalachurya usurpation; the Chalukya restoration and extinction.

XV. *The Pandya Revival in the South.*—The revival of Pandya power under the successors of Kulottunga III: Rajaraja III; Pandyan invasions under Maravarman Sundara Pandya I; Hoysala intervention; Hoysala alliance with the Pandyas; Hoysala dominance in the South under Maravarman Sundara Pandya II; Jatavarman Sundara Pandya I; his wars and the end of Hoysala dominance in the Tamil country; successors of Jatavarman Sundara; Maravarman Kulasekhara and the prosperity of the Pandya kingdom; the wars between his sons and the Muhammadan invasion.

XVI. *The Feudatory Dynasties; I. The Hoysalas.*—The feudatories of the Chalukyas; the Hoysalas of Dvarasamudra; foundation of their power; its growth under Vishnuvardhana and Vira Ballala II. Hoysalas as an independent dynasty; Narasimaha II and the Hoysala expansion southwards; Somesvara and the Hoysala ascendancy in the south; division of the empire between Narasimha III and Vira Ramanatha; Vira Ballala III, ruler of the whole of the Haysala territory; the Muhammadan invasions.

XVII. *The Feudatory Dynasties; II. The Yadavas of Devagiri.*—Seunas or Yadavas of Devagiri; the early rulers; Bhillama III, Viceroy of Somesvara I; Seunachandra II, Bhillama IV, the first paramount sovereign of this dynasty; Jaituji; Singhana; Devagiri, his capital; his wars against the Hoysalas and the Kakatiyas; Krishna and Mahadeva; relations between the Yadavas and the Kakatiyas; Yadavas and the Hoysalas; Ramachandra; Muhammadan invasions under him; Harapala; reduction of the kingdom by Mubarak Khilji.

XVIII. *The Feudatory Dynasties; III. Kakatiyas of Warangal.*—Foundation of the Kakatiya power, Prola; Prataparudra;

transfer of capital to Warangal; Mahadeva; Ganapati-Rudrama or Rudramba Prataparudra II; Muhammadan invasions in his reign; Krishna, his son the last ruler of the dynasty.

XIX. *The Muhammadan Invasions and the Foundation of Vijayanagar.*—Muhammadan invasions of South India, their character, extent, and result; the empire of Muhammad Tughlak; Muhammadan possessions south of the Vindhyas; Hindu struggle for the independence under Hoysala leadership; foundation of Vijayanagar and the Bahmani kingdoms.

XX. *Vijayanagar under the first dynasty.*—The first dynasty; Harihara and Bukka; the wars of the latter; Harihara II, assumption of imperial titles and responsibility; relations with the Bahmani kingdom under Harihara and his successors; the Bahmani wars and their character; Devaraya II, the greatest ruler of the first dynasty; the city and the empire under him, rise of Orissa; alliance between Orissa and the Bahmani kingdom; Devaraya's successors; condition of the empire.

XXI. *Vijayanagar under the usurpation; Saluvas and Tuluvas.*—The rise of the Saluvas; their position in the empire; the Bhamani and Orissa invasions; Saluva Narasinga; the character of his usurpation; his services to the empire; Narasa as *de facto* ruler; his son Narasimha II and general rebellion in the empire; accession of Krishna Devaraya: the condition of the Bahmani kingdom in the period of usurpation and after; wars against the Bahmani kingdom and the Raichur; the condition of his empire; rebellions in the empire and the last years of Krishna. Achyuta's restoration of order in the empire; character of his later administration; rise of Achyuta's brothers-in-law the elder and the younger Tirumala; Sadasiva; the rule of the brothers Rama, Tirumala and Venkata.

XXII. *Vijayanagar under the* de facto *rule of the brothers.*—Sadasiva the nominal ruler; relations with the Bahmani kingdom; condition of the distant south; "fishery coast" and Travancore; foundation of the Nayakship of Madura; the Portuguese; Talikota and its results; condition of the empire.

XXIII. *The later empire at Penukonda.*—The new empire at Penukonda; Tirumala; the successors of Tirumala; division of the empire; Sriranga emperor; his struggle against the advance of Muhammadans; the empire reunited under Venkata; disaffection in the southern provinces; wars against the Muhammadans; end of the viceroyalty of Seringapatam; foundation of Mysore; death of Venkata.

XXIV. *The decline and fall of the Vijayanagar empire.*—War of succession; the weakened condition of Vijayanagar; the provinces of the empire; Gingi, Tanjore, Madura, Mysore, and Ikkeri; the advance of the Mughals in the Dakhan, precarious condition of the Vijayanagar Empire; the last Emperor, Sriranga; his struggle for a united empire; end of the empire.

XXV. *Madura and Mysore, the sole remnants of the empire.* —Madura and Mysore continue as remnants of the empire; Mahrattas in the south; Shaji's conquests for Bijapur; occupation of Gingi and Tanjore; Sivaji's invasion of the south; Madura under the Nayaks; Mysore under Chikkadevaraya Odaiyar and his successors to the usurpation of Hyder Ali.

(4) URDU.

The course shall consist of:—

(*a*) Prose books from different periods, including at least one modern work.

(*b*) Poetry books from different periods, including at least one modern work.

(*c*) Translation from prose and poetry books other than the set books, translation from English into Urdu to be made in an approved modern style.

(*d*) History of Language and Literature.

(*e*) Indian History—Muslim Period, *or* Arabic *or* Persian.

(5) ARABIC OR PERSIAN (MAIN).

The course shall consist of:—

(*a*) Prose books selected from different periods.

(*b*) Poetry books selected from different periods.

(*c*) Translation from prose books other than the set books: translation from the set poetry books and from English into Arabic *or* Persian prose.

(*d*) History of Language and Literature with special reference to the set books.

(*e*) A selected period of early Muslim History.

The periods of History for Persian or Arabic may be one or other of the following:—

1. The four first Khalifas and the Umayyad Khalifate, excluding Africa and Spain.

2. The Abbasid Khalifate, excluding Africa and Spain and the wars of the Crusades.

3. The Muslim conquest of Egypt and Northern Africa until the fall of the Abbasid Khalifate and excluding the wars of the Crusades.

4. The Arab conquest of and rule in Spain.

5. The wars of the Crusades.

(b) ARABIC OR PERSIAN (SUBSIDIARY).

The course shall consist of the study of selected pieces from one poet of the classical period and selected portions from the works of one standard prose writer. There shall be one paper in the examination of three hours' duration which shall include pieces for translation from Arabic or Persian into the main language.

(6) ORIYA OR MARATHI.

The course shall be the same as for the Dravidian Languages, with the substitution of Gaudian Grammar for Dravidian Grammar, and of the Early History of Orissa or the History of the Marathas respectively for Early South Indian History.

(7) GREEK OR LATIN.

The course shall consist of:—

(*a*) Prescribed portions of the writings of the more important Greek or Latin authors.

(*b*) Grammar of the language with reference to Indo-Germanic Grammar.

(*c*) Greek or Latin Prose composition and translation of unprepared passages.

(*d*) A general knowledge of Greek History to the death of Alexander, or of Roman History to the death of Trajan, with a more minute knowledge of some prescribed period.

(*e*) A general knowledge of Greek or Roman Literature with a more minute knowledge of the authors of the prescribed books.

(8) FRENCH OR GERMAN.

The course shall consist of:—

(*a*) The study of set books representative of various periods of French or German literature.

(*b*) The History of French or German literature with special reference to the set books.

(*c*) The history of the French or German language.

(*d*) Translation from French or German into English, and of English into French or German.

(*e*) Composition.

(*f*) A period of European History with special reference to French or German History.

In the examination the subjects for composition shall be taken from the set books or shall relate to the periods of French or German literary or political history studied in the course. In the translation paper, the passages set for translation from French or German into English shall be specimens of modern French or German, not taken from the set books.

(9) HEBREW.

The course shall consist of:—

(*a*) Set books.

(*b*) Grammar and translation from and into Hebrew.

(*c*) History of the Language and the Literature.

(*d*) A selected period or periods of the History of the Jews.

Syllabus for the History of Literature for Arabic, Persian and Urdu under Part II.

(Any one of the following periods may be prescribed).

Periods of Literary History for Arabic.—

1. Pre-Islamic Period.
2. First two Centuries of Islam.
3. Later Abbasid Period—up to the sack of Bagdad.
4. History of Arabic Literature in Spain.

Periods of Literary History for Persian.—

1. Persian Literature under Tribal Kings—850—1000 A.D.
2. Safani Period.
3. Development of Persian Literature in India.
4. Modern Persian Literature.

Periods of Literary History for Urdu.—

1. Early Hindi and Dakhni Literature.
2. From Wali to Mir and Sawda.
3. From Sawda to Ghalili.
4. Development of Prose after 1858.
5. Modern Essays, Novels and Dramas.
6. Modern Urdu Poetry.

GROUP (VI)—INDIAN MUSIC.

Theory.—

In addition to the Intermediate Syllabus, the following:—

1. *Acoustics.*—Production and transmission of sound waves; simple harmonic motion; vibrations of stretched strings; sympathetic vibration; Reflection of sound waves of echoes. Acoustics of the auditoria.

2. *Physiological Acoustics.*—Ear, larynx, etc.

3. *Musical Instruments.*—Musical Instruments that are in use in Southern India and their classification into stringed, wind and percussion groups. A general knowledge of the structure of the Violin, Veena, Tambura, Gotuvadyam, Flute, Nagaswaram, Mridangam, Tabala and Tavil.

4. *History of Music.*—History and development of South Indian Music with special reference to the following scholars, composers and musicians:—

1. Ahobala.
2. Rama Amatya.
3. Venkatamakhi.
4. Purandara Vittala.
5. Narayana Tirtha.
6. Bhadrachala Ramadas.
7. Parameswara Bhagavathar.
8. Maha Vaidyanatha Ayyar.

Biographies of the above.

5. Principles of Musical Composition.

6. Gamakas; the theory of 22 srutis.

7. A knowledge of the following 20 ragas and of at least one musical composition under each:—

1. Asaveri
2. Dhanyasi
3. Gaulipantu
4. Chakravakam
5. Ritigaula
6. Kharaharapriya
7. Sriranjani
8. Darbar
9. Sahana
10. Surati
11. Natakuranji
12. Atana
13. Kedaram
14. Begada
15. Hamsadhvani
16. Nilambari
17. Suddha Saveri
18. Kamavardhani
19. Poorva Kalyani
20. Saranga.

8. Critical study of two kritis each of Tyagaraja, Muthuswamy Dikshitar and Syama Sastri and two musical compositions each from any five of the following 22 composers:—

1. Anayya
2. Arunachala Kavirayar
3. Doraiswamy Ayyar
4. Garbhapuri
5. Gopala Krishna Bharati
6. Pallavi Gopalayya
7. Kshetragna
8. Veena Kuppayya
9. Lakshmana Pillai
10. Muthiah Bhagavathar
11. Purandara Vittala
12. Ramaswami Sivan
13. Mysore Sadasiva Rao
14. Pallavi Seshayyar
15. Ramnad Srinivasa Ayyangar
16. Dharmapuri Subbarayar
17. Subbaraya Sastri
18. Patnam Subramanya Ayyar
19. Tirtha Narayanaswami
20. Tiruvotiyur Tyagayyar.
21. Vasudevachari (Mysore)
22. Swati Tirunal (late Maharajah of Travancore.)

There shall be two theory papers of three hours' duration each carrying 100 marks.

PRACTICAL.

There shall be two practical examinations carrying 100 marks each and students shall show their musical proficiency either through vocal music or by playing one of following instruments:—

1. Violin. 2. Veena. 3. Flute. 4. Gotuvadyam.

At the practical examination, the candidates' knowledge of tuning of the Violin, Veena, Tambura and Gotuvadyam will be tested.

Candidates will be expected to:—

(i) sing or play compositions in Adi, Roopaka, Triputa, Chapu and Jampa talas;

(ii) sing or play to the accompaniment of the Tambura;

(iii) sing or play *manodharma swaras* in the songs learnt by them in the following six ragas:—

1. Todi	2. Bhairavi	3. Mohana
4. Kambhoji	5. Sankarabharana	6. Kalyani.

A separate minimum of thirty per cent. will be required under theory as well as under practical.

Books for Reference—

1. Gayakalochanam by Tachur Singaracharlu
2. Ganendu Sekharam by Tachur Singaracharlu.
3. Pallavi Swarakalpavalli by Tiruvottiyur Tyagayyar.
4. Sangita Sampradaya Pradarsini by Subbarama Dikshitar (2 vols.)

5. Sangita Swara Prastara Sagaram by Nadamuni Panditar.

6. Karunamirtha Sagaram by Abraham Pandithar.

7. Principles of Layam by K. Ramachandran, The Indian Music Publishing House, Madras.

8. Music of Hindusthan by A. H. Fox-Strangways.

9. Music and Musical Instruments of Southern India and Deccan by Capt. Day.

10. Madras Museum Bulletin on South Indian Musical Instruments by P. Sambamurti (Govt : Museum, Egmore, Madras.)

11. Musical Instruments in the Indian Museum, Calcutta, by Dr. Meerwarth.

12. Richardson: " Sound."

13. Acoustics of the Auditoria by Davis and Kaye.

Group (vii)—GEOGRAPHY.

(With effect from the Examination of 1933.)

(1) *Regional Geography*:—The study of a larger region, such as a continent or continents, and a more detailed study of a smaller region—both regions being prescribed from time to time.

(2) *Economic Geography.*—

(i) *General relations between Physical and Economic Geography*:—The influence of physical features, climate and the nature and distribution of soils and minerals on the distribution and growth of vegetation and animal life, and on the occupations, health and efficiency of man.

(ii) *Chief World Commodities*:—Distribution and conditions of production, relative supply and markets. Foodstuffs of vegetable and animal origin—mineral products—materials used in the textile industries—rubber, oils, timber, leather, and other articles of importance in the world commerce.

(iii) *Chief Industries*:—Their regional distribution, special attention being paid to textile, iron, and steel, ship-building and chemical industries—sources of

mechanical power—the labour force in various parts of the world.

(iv) *Transport and Trade-routes*: inland and oceanic-relation to hinterland and markets. World ports—Exchange of products. Development of new regions and sources of trade.

(v) *Study of a particular region* other than that selected for special regional study—to be prescribed from time to time.

(3) *Physical Basis of Geography*:—

(i) (a) An elementary knowledge of the common rocks and of the simple geological structures and of the influence of geological factors on land forms.

(b) A very simple and general treatment of the geological history of the earth's crust, indicating the main features of the great geological systems—Archaean, Palaezoic, Mesozoic, and Tertiary.

(ii) A more detailed treatment than in the Intermediate syllabus of the surface features of the Earth with special reference to the evolution of land forms and to the various theories which have been put forward to account for their development.

(4) *Cartography*:—The study and interpretation of topographical maps of various scales and types, and of very simple geological maps. Methods of showing relief and other features. Scales and their transformation. A knowledge of the principal maps in use in the chief countries of the world and the 1|M International map.

Simple methods of survey, including the use of the chain, the plane-table, prismatic compass, and the clino-meter.

The principles of the following projections:—Mercator, Mollweide, simple conical, Gall's stereographic, orthographic, and Lambert's equivalent azimuthal. Candidates are expected to know the principle underlying each projection, its defects and its suitability for particular purposes or areas. They should be able to identify each projection as far as possible by inspection or rough measurement.

Candidates will be expected to show some acquaintance with field work; and their field work note-books will be submitted for scrutiny.

TEXT-BOOKS.

B. A. Degree Examination, 1931.

(Revised Regulations)

PART I—ENGLISH.

**Shakespeare.*

Hamlet: Much Ado about nothing.

Plays for General Reading:—

†Henry IV, Part I; Antony and Cleopatra; The Tempest.

Modern Poetry—

Milton: Lycidas.

Wordsworth: Tintern Abbey.

Shelley: Adonais.

Browning: Andrea del Sarto.

Rosetti: The Blessed Damozel. Published in Pattern Poetry III.—Thomas Nelson & Sons; and the following selections from "A Third Book of Modern Poetry" Edited by H. Treble, (Macmillan & Co.).

No. II.—Bridges: There is a Hill.

No. V.—Drinkwater: The Carver in Stone.

No. VII.—Flecker: Gates of Damascus.

No. XIII.—Masefield: Fragments.

No. XV. Sturge Moore: Sent from Egypt.

No. XVII.—Watson: Lacrimae Musarum.

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*Under Shakespeare, the Old Regulation and the Transitory Regulation candidates will study only the †three plays prescribed under the New Regulations and not the life and work of the author as under the old Regulations.

The question papers will be common to all candidates in Shakespeare and Modern Poetry and the papers in Prose and Composition will be different.

Prose I—

(1) Lamb: Essays of Elia: Edited by A. H. Thompson, Cambridge University Press.

(2) *Johnson: Prose selections in Johnson: Prose and Poetry, (Clarendon series). (Oxford University Press).

For Non-Detailed Study—

Jane Austen: *Emma.*

Prose II—

(1) Newman: Literary Selections. Longman's Green and Co., Indian University Edition.

(2) Arnold: Selections. Edited by H. W. Rawlinson, Macmillan & Co.

For Non-Detailed Study—

(1) Hardy: Far from the Madding Crowd.

(2) Selected English Short Stories. Third Series—World's Classics.

SANSKRIT.

PART II.

1931.

1. Kālidāsa—Śākuntala (whole).
2. Kālidāsa—Mēghasamdeśa (whole).
3. Bāṇa—Harṣacarita—The third ucchvāsa only.
4. Daṇḍin—Kāvyādarsa—The first pariccheda only.

In connection with the History of Sanskrit Literature, a detailed study of Chapters X to XIV in Macdonell's History of Sanskrit Literature and of the whole of Keith's Classical Sanskrit Literature (Heritage of India Series) is recommended.

Note:—All these Sanskrit and English books can be had either through the Oriental Books-Supplying Agency, 15, Shukrawarpet, Poona or through the Proprietor, the Punjab Sanskrit Book Depot, Lahore.

**Note.*—Candidates are required to show a knowledge of the introductory essays in the book.

PART III—GROUP (V)

(*a*) A. A. Macdonell : Védic Reader, I to VIII hymns.

Aitaréya-brāhmaṇa, VIII, ii, iii (Nirnaya Sagara Press, Bombay).

Gautama Dharma Sūtra—Text only—Prasna I corresponding to Chaps. I to IX.—Bibliotheca Sanskrita (Government Press, Mysore or Anandas'rama Press, Poona).

Cchāndōgyōpaniṣad—Adhyaya VII.

(*b*) Kṛṣṇa-Miṣra : Prabōdhacandrōdaya } (Nirnaya Sagara Press, Bombay).
Bāṇa : Harṣacarita, Ucchvasa III

Patañjali : Mahābhāṣya I, i, i.

Māhābhārata, Śāntiparva—Adhyayas 177 to 182 (Madhva Vilas Book Depōt, Kumbakonam).

Nílakaṇṭha Vijaya by Nílakaṇṭha Dīkṣita, Ucchvāsa I only (The Proprietor, Balamanorama Press, Mylapore).

Bhavabhūti-Uttararāmacarita.

(c) History of Sanskrit Literature:—

Dr. Macdonell's "History of Sanskrit Literature" and "India's Past" are recommended for study.

RELATED LANGUAGE.

Bhavabhūti-Uttararāmacarita.

Raghuvamsa-Cantos IV and VI.

RELATED SUBJECT.

Early History of India to the beginning of the present era (*i.e.*, Christian era).

Books recommended—

E. J. Rapson: Ancient India (Cambridge University Press).

V. A. Smith: Early History of India.

Dr. Macdonell's 'India's past'.

MARATHI.

1931.

PART II.

For Detailed Study—

Prose—

Shivchhatrapati's life by Sabhasada.

Poetry—

Krishna Vijaya (Uttaràrdha) by Moropant—Chaps. I to X.

Nàmsudhà by Waman Pandit, edited by B. A. Bhide, B.A.

Jnaneshwari—Ch. XII.

Drama—

Shakuntalà by L. G. Lelé.

For Non-Detailed Study—

Nibandha Sangraha Grantha II—Essays Nos. 1, 2, 3, 7, 8 and 9.

For History of Language and Literature the following books are recommended for consultation:—

Bháve's Mahârastra Saraswata.

Marathi Bhashhechi Ghatana by R. B. Joshi.

N.B.—All these books can be had from New Kitabkhana, Dhodhwarpet, Poona City, Chitrashala Press, Poona City, or from Messrs. Parachura Puranick and Co., "Madhava Bagh", Bombay.

PART III—GROUP (V).

Poetry—

Rasatarangini by S. V. Pendse, B.A., pages 398—456.

Krishna Vijaya by Moropant: (Uttarárdha) Chapters 50—57.

Drama—

Sakuntalá by Laxman Shastri Lele.

Prose—

Vyákhyáne by Sir N. G. Chandávarkar.

Life of Thorale Shahu Mahàráj by M. R. Chitnis.

Nibandha Sangraha—Grantha Dusará—Sri Laxminarayan Press, Bombay, pages 1—258.

RELATED SUBJECT.

The History of the Marathas up to 1720.

Books recommended—

M. G. Ranade : Rise of the Maratha Power Grant Duff : History of the Marathas (Calcutta, 1912)	New Kitab-Khana, Poona City or Messrs. Parachure Puranick & Co, "Madhava Bagh," Bombay.

ORIYA.

1931.

PART II.

For Detailed Study—

Prose—

Prabandha Prakasa by Ratnakara Pati.

Itihasa Prasanga by C. Acharya.

Poetry—

Rasakollala by Deenakrishna Das.

Drama—

Pratap Natak by Raja of Chikati.

For Non-Detailed Study—

Arya Jeevana by Nilakantha Das.

For History of Language and Literature the following books are recommended for consultation:—

Utkala Bhashara Itihasa by B. Misra.

Utkala Sãhityara Itihãsa by T. Ratha.

Utkala Sãhityara Itihasa by B. Misra.

N.B.—All the above books can be had from "The Mukur Press, Cuttack", or from "The Trading Company, Cuttack," or from "The Students' Stores, Berhampur, (Ganjam District.)."

PART III (Group V)

Pāñcāli Paṭṭāpaharana, by Sri Radhamohan Rajendra Deb.	(Trading Company, Cuttack)
Kōṇurkē (Māyadevi, pp. 67 to the end), by Nilakantha Das.	
Vidagdha Cintāmani (Canto 78, pp. 215–218), by Abhimanyu Samanta Simhāra.	
Bhāgavata (Pañcama Skandha), by Jaganath Das.	

Unmatta Raghava, by Pandit Gopinath Nanda Sarmā (Utkal Sahitya Press, Cuttack).

Kiskindhyā Kānda,—Ramayan, by Kṛṣna Caraṇ Patnaik (Printing Company, Cuttack).

Vibidha Prabandha, by Viswanath Kar (Utkal Sahitya Press, Cuttack).

RELATED SUBJECT.

The History of Orissa under Native and Muhammadan Rule.

Book recommended—

W. W. Hunter: Orissa.

HINDI.

1931

PART II.

For Detailed Study—

Prose—

Lokhanjali by Pandit Mahavir Prasad Jee Divedi, published by Hindi Pustak Agency, Harrison Road, Calcutta.

Poetry—

Padya Samuchaye by Kamta Prasad, published by Indian Press, Ltd., Allahabad.

Drama—

Chandrahas Maitli Sharan Gupta, published by Sahitya Sadan, Chirgaon, Jhansi, U.P.

For Non-Detailed Study—

Charitra Chintan by Chabinath Pandey, B.A., LL.B., published by Hindi Pustak Agency, Harrison Road, Calcutta.

Bhagavan Budha Dev, published by Ganga Pustak mala Karyalaya, Aminabad Park, Lucknow.

For History of Language and Literature the following books are recommended for consultation:—

Bhasha Vigyan by N. Sanyal, M.A., published by Indian Press, Limited, Allahabad.

Rachara Chandradaya by Ramlochan Sharam, published by Hindi Pustak Bhandar, Darbhanga.

Keay's History of Hindi Literature.

Sketch of Hindi Literature.

Mishrabandhu Vinoda, Vol. I, Introduction

LATIN.

1931

PART II.

Virgil: Aeneid II.

Horace: Odes III, 1-20.

Cicero: De Officiis III.

Tacitus: Annals, I.

PART III.

Group (v), New Regulations and Part II, Group (vi), Old Regulations.

Virgil: Aeneid Il

Horace: Odes III, 1-20.

Juvenal: Satires VII and X.

Livy: History Book V.

Cicero: De Officiis.

Tacitus: Agricola and Germania.

RELATED SUBJECT.

The History of Rome: The second century B. C.

FRENCH.

1931

PART II.

Faguet: Ce que disent les Livres.

Hémond : Maria de Chapdelaine.

Corneille: Le Cid.

Molière : Le Malade Imaginaire.

PART III.

Group (v), New Regulations and Part II, Group (vi), Old Regulations.

Faguet: Ce que disent les Livres.

Hémond : Maria de Chapdelaine.

Corneille: Le Cid.

Molière : Le Malade Imaginaire.

De Tocqueville: L'Ancien Regime

The Oxford Book of French Verse.

RELATED SUBJECT.

European History—1715-1815.

ARABIC.

1931

PART II.

1. Màjani-'ul-Adab, Volume 3.—First half.
2. Tarikhu Adábil Lughat by Daraz.
3. Qawa'idul Lughatil' Arabiyyah.

Note:—History of Pre-Islamic Arabic Literature may be studied.

PERSIAN.

PART II.

1931.

Anwári Suhayli 1st and 2nd Chapters by Ja'fari.

Diwáni-Háfiz-Radít Dal.

Misbáhul Qawaid by Ja'fari.

***Note*:—History of Persian Literature during the rule of Tribal Kings (850—1000 A.D.)**

URDU.

PART II.

1931.

Mazamin-i-Farhat.

Intikhabi-Ghazaliyyati-Zauq by Shah Sulaymán.

Jalaluddin Khawrzim Shah by Sajjad Hyder.

Asasi-Urdu by Ja'fari.

Note:—From Wali to Mir and Sawda in History of Urdu Literature by Saksina.

ARABIC.

1931

PART III—GR. (v).

Rijalul Mu'allaqatil 'Ashar (Imraul Qays. Zuhayr and Antarah).

Máqámát-i-Badi'uzzamán—First 14 maqámahs.

Saqtuz Zand 1st 15 poems.

The Qur'an—Sura-i-Luqmán, Táhá and Yúsuf.

The following books are recommended for study:—

Palmer's Arabic Grammar.

Literary History of the Arabs by Nicholson.

Husnut Tawasul ila Sanaât it-Tarassul.

PERSIAN.

1931

PART III—GR. (v).

Sarmāy-i-Dānish by Jáfari.

Sih Natthar Zahúri—First Nathar.

Masnaví Maulana Rúmi—(First Dafter 1st half).

Khizinatul Fawaid, Part II (Grammar, etc.)

RELATED SUBJECT.

ARABIC AND PERSIAN.

The first four Caliphs and the Umayyads.

URDU.

1931

PART III—GR. (v).

Hayáthi-Jávíd, Part II excluding appendices.
Âbi-Hayáth excluding introduction.
Musaddasi-Háli.
Intikhábi-Kalámi-Mír.
Muqaddima-i-Shi 'ro Sha 'iri.

The following books are recommended for study:—

Qawaidi-Urdu.
Tashilul Balaghat.
History of Urdu Literature by Saksina.

RELATED SUBJECT.

The later Three Mughals.

HEBREW.

1931

PART II.

The First Book of Kings.
Isaiah—Chapters 40—66.
Psalms—1 to 41.
Amos.

TAMIL.

PART II

1931.

(Selections published by the University.)

Poetry—

1. Pattuppattu-Mullaippattu (பத்துப்பாட்டு-முல்லைப்பாட்டு).
2. Purananuru (புறநானூறு)—20 stanzas.
3. Kural (குறள்)—10 Chapters.
4. Kambaramayanam–Māyāsanakappadalam (கம்பராமாயணம்-மாயாசனகப் படலம்).
5. Periyapuranam—Tirukkurupputthonda Nayanar Puranam (பெரியபுராணம்-திருக்குறிப்புத்தொண்டநாயனார் புராணம்).
6. Maduraikkalambakam (மதுரைக்கலம்பகம்)—40 stanzas.
7. Kanchippuranam—Nattuppadalam—Tinaimayakkam (காஞ்சிப்புராணம், நாட்டுப்படலம்—திணைமயக்கம்),

Detailed Prose—

1. Azhvargal Kalanilai (ஆழ்வார்கள் காலநிலை) —(up to page 94 inclusive) by Mr. M. Raghava Ayyangar, Tamil Lexicon Office, Limbdi Gardens, Royapettah, Madras.
3. Manonmaniyam (மனோன்மணீயம்)- Acts, III to V. by late Prof. Sundaram Pillai of Trivandrum.

Non-Detailed Prose—

1. Essay on Tamil by T. Chelvakesavaraya Mudaliyar. (Alagan & Co., Perambur, Madras.)
2. Palantamil Perumakkal (பழந்தமிழ்ப் பெருமக்கள்).—by Mr. S. Somasundara Desikar, Tamil Lexicon Office, Limbdi Gardens, Royapettah, Madras.

PART III—Gr. (v).

Poetry, Volume I—Part I.

University Selections—

Pattuppattu-Pattinappalai, (பத்துப்பாட்டு) பட்டினப்பாலை, pp. 28 to 39.

Pathitruppathu, (பதிற்றுப்பத்து), pp. 48 to 59.

Purananuru, (புறநானூறு) pp. 72 to 96.

Tirukkural, (திருக்குறள்) Chapters 98 to 108, pp. 220 to 229.

Silappathikaram, (சிலப்பதிகாரம், இந்திரவிழவூரெடுத்த காதை, கடலாடு காதை, கனாத்திறமுரைத்த காதை)— pp. 266 to 288.

Purapporul Venbamalai (புறப்பொருள்வெண்பாமாலை) pp. 377 to 383.

Poetry, Volume II—Part II.

University Selections—

Kamba Ramayanam, (கம்பராமாயணம்-ஆரணியகாண்டம்) pp. 69 to 106.

Kandapuranam, (கந்தபுராணம்-குமாரக்கடவுள் திருவவதாரம்) pp. 232 to 238.

Tiruviruttam, (திருவிருத்தம்) pp. 283 to 289.

Prose.—

Cholan Karikalan (சோழன் கரிகாலன்) by Mr. L. Ulaganatha Pillai.

Kambar (கம்பர்) by T. Chelvakesavaroya Mudaliyar.

Tamil Moli Varalaru, (தமிழ் மொழி வரலாறு) by V. G. Suryanarayana Sastri.

Grammar.—

Nannul (நன்னூல்)

Cholladikaram, Sankaranamasivaya's Commentary, (சொல்லதிகாரம், சங்கர நமச்சிவாயர் உரை).

RELATED SUBJECT.

Vide page 151.

TELUGU.

1931.

PART II.

***Poetry*—**

***University Selections*—**

Part I. 46. Draupadi Haranamu. Saindhava Bhangamu, 118 verses.

Part II. 26. Panchanali Nalavaranamu, 30 verses.

Part III. 38. Manjuvani Dutyamu, 68 verses.

***Modern Poetry*—**

i. Meghasandesamu, by Vaddadi Subbaraya Kavi, 121 verses.

ii. Sree Singara Kadambari, by Ch. Narasimha Sastri Canto, 5, Purvabhagamu, 1 to 170.

***Drama*—**

i. Naganandamu, by Vedam Venkatraya Sastrulu. (V. Venkataroyar, Mallekeswar Koil Street, G. T. Madras).

***Prose*—**

i. Bhagavatamu by Sathaghantamu Venkatarangayya Sastri—1st Skandham, pages 1 to 81.

ii. Parasurama Vijayamu, by Korada Ramachandra Sastri. (Korada Ramakrishnayya, O. R. Institute, Limbdi Gardens, Royapettah, Madras).

iii. Andhra Vachana Bharatamu by Kaluve Veera Raju—Sabhaparvamu, pages 112 to 216, published by M. K. Venkatesam, Government Arts College, Rajahmundry.

Non-Detailed—

i. Rajarshi by G. Satyagodaveri Sarma, Telugu Pandit, P. S. High School, Mylapore, Madras.

ii. Veera Bai by S. Bhashyakacharyulu, Hindu High School, Triplicane, Madras.

Grammar—

Syllabus will be prescribed later.

Prosody and Poetics—

i. Margopadesika by V. Chinna Seetarama Sastri, O. R. Institute, Limbdi Gardens, Royapettah, Madras.

ii. Balavyakaranamu, in the light of Gupthartha Prakasika.

iii. Kavijanasrayamu, Andhra Sahitya Parishat, Cocanada.

iv. Narasabhupaleeyamu. (V. R. Sastrulu & Sons, Madras).

PART III—GROUP V.

Poetry—

i. Parijatapaharanamu by Mukku Timmanna, cantos 2, 3 and 4. (V. R. Sastrulu & Sons, Madras).

ii. Vasu Charitramu by Ramaraja Bhushana, canto 3. (V. R. Sastrulu & Sons, Madras).

iii. Yayati Charitramu by Ponnaganti Telaganaryudu, canto 2. (V. R. Sastrulu & Sons, Madras).

iv. Harischandra Nalopakyanamu, canto 3. (V. R. Sastrulu & Sons, Madras).

Drama—

i. Venisamharamu by Vaddadi Subbaraya Kavi. (Author, Rajahmundry).

ii. Sri Ramuni Vanavasa Natakamu by Janamanchi Seshadri Sarma. (Author, Cuddapah).

Grammar, Prosody and Poetics—

Syllabus will be prescribed later.

Books recommended for study—

(a) *Literary Criticism—*

Vasu Charitra Vimarasanamu by V. Chinna Seetarama Sastrulu. (V. R. Sastrulu & Sons, Madras).

(b) *History of Literature—*

i. Andhra Vangmaya Charitramu by Vanguri Subba Rao. (Kamalakutir, Narsapur, W. Godavari).

ii. Lives of the Poets, by Veeresalingam Pantulu. (Hitakarani Samaj, Rajahmundry).

iii. Andhra Kavi Jeevitamulu by Gurazada Sree Ramamurti. (V. R. Sastrulu & Sons, Madras).

(c) *History of Language*—(as per syllabus, *vide* pages 118—120) Bhashotpathi Kramamu by Korada Ramakrishnayya.

(*d*) *Grammar, Prosody and Poetics—*

i. Margopadesika by V. Chinna Seetarama Sastri.

ii. Balavyakaranamu—In the light of Gupthartha Prakasika.

iii. Proudha Vyakaranamu.

iv. Appa Kaviyamu, 3rd Canto. (V. R. Sastrulu & Sons, Madras).

v. Kavyalankara Choodamani, cantos 1 to 8. (V. Venkataroyar, Mallekeswarar Koil Street, G.T., Madras).

vi. Dasaroopakamu, by Malladi Suryanarayana Sastrulu. (Government Arts College, Rajahmundry).

RELATED SUBJECT.

Vide page 151.

KANARESE.

1931

PART II.

(1) Selections published by the University, Part II, Pages 354 to 398 (Ramaswamedha).

(2) Santi Purana by Ponna—Chapters 1, 2 and 3, (People's Printing and Publishing House, Triplicane, Madras).

(3) Gadāyuddha Nātaka by B. M. Srikantaiya, M.A., B.L., (Secretary, Central College Karnataka Sangha, Bangalore City.)

(4) Durgesha Nandini by B. Venkatachar, (The Bangalore Printing and Publishing Co., Ltd., Bangalore).

(5) Karnataka Kavi Charite by Rao Bahadur R. Narasimhachar, M.A., Vol. III, (pp. 1—163), 18th Century, (Author, Malleshwaram, Bangalore).

PART III—(GROUP V).

(i) Selections published by the University—Volume II, Chandraprabha Purana (pp. 103 to 146).

(ii) Ramashwamedha (modernized), Part I, by M. Shankara Bhatta (Bala Sahitya Mandala, Mangalore.)

(iii) Viddyullata by N. Tirumalamma (Sati Hitaishini Granthamala Office, Nanjangud).

(iv) Sakuntala Nataka by Basappa Sastri (M. S. Rao & Co., Avenue Road, Bangalore City.)

(v) Kavi Charite by Rao Bahadur R. Narasimhachar, M. A., Volume II, Introduction and Poets of the 16th Century (Author, Malleshwaram, Bangalore).

(vi) Sasana Padyamanjari by Rao Bahadur R. Narasimhachar, M.A., Malleshwaram, Bangalore.

(vii) Apratima Vira Charite by Tirumalarya (Kavya Kalanidhi Office, Mysore).

(viii) Sringara Ratnakara by Kavi Kama (Kavya Kalanidhi Office, Mysore).

(x) Sabdamani Darpana by Kesiraja (B. E. M. Book Depot, Mangalore).

(xi) Chhandassu by Nagavarma (B. E. M. Book Depot, Mangalore).

(xii) Primrosa Vijaya by S. G. Govindaraja Ayyangar (M.S. Rao & Co., Avenue Road, Bangalore).

RELATED SUBJECT.

Vide page 151.

MALAYALAM.

1931.

PART II.

Prose—

(Non-detailed) for Paper I.—

1. Kshathraprabhâvam by A. Narayana Poduvalsyar.

2. Prâcheena Bharathathila Viswa Vidyalayangal by P. Anujan Achan—Ramanuja Printing House, Trichur.

Poetry—

(Detailed) for II Paper.—

1. Krishnagâtha—Rugmani Swayamvaram by Cherusseri —Selections published by the University for B.A., Volume I, Part III.

2. Kirmmeeravadham Kathakali by Kottayath Thampuran, with introduction and notes by P. Krishnan Nair (Siromani), published by Vidyavinodini Press, Trichur.

3. Kesaveeyam—9th Sargam—B. V. Book Depot, Trivandrum—Selections published by the University for B.A., Volume II, Part III.

Prose—

Vinodini-Novel—by V. Unni Krishnan Nair, B.A.,—Mangalodayam Press, Trichur.

PART III—GR. (V).

Poetry—

1. Bhishma Parvam—Maha Bharatam by Ezhuthachan—Selections published by the University for B.A. Vol. II, Part I.

2. Kirmmeeravadham—Kathakali—by Kottayath Thampuran (By any publisher).

3. Umakeralam—7 and 8 Sargams. By Ullur S. Parameswara Ayyar, M.A., (B. V. Book Depot, Trivandrum).

Drama—

Uthara Rama Charitham by C. Chathukutty Mannadiar (Saraswati Vilasam Book Depot, Trichur).

Prose—

1. Marthanda Varma by C. V. Raman Pillai, B.A. (B. V. Book Depot, Trivandrum).

2. Sārada—Part I, by O. Chandu Menon (Published by K. Madhava Menon, B.A., B.L., Vakil, Chalapuram, Calicut).

3. Ramacharitam—5 to 9 Patalams, both inclusive (B. V. Book Depot, Trivandrum).

4. Kannassa Ramayanam—Balakandam. (The edition published by K. Parameswaran Pillai, M.A., Nantiyar Veetu, Thampanoor, Trivandrum.

5. Krishnagatha—Soubhadrika Katha (Mangalodayam Press, Trichur).

RELATED SUBJECT.

1931.

Dravidian Languages.

Early South Indian History, the part prescribed in Chapters I to XVIII of the Syllabus, *vide* Pages 125—128.

B. A. DEGREE EXAMINATION, 1932.

ENGLISH.

1932

PART I.

Shakespeare : Much Ado about nothing.
King Lear.

Plays for general reading :—
* Romeo and Juliet, Coriolanus, Winter's Tale.

Modern Poetry—
Milton : Paradise Lost, Book II.
Pattern Poetry Part III (Nelson). *The following selections* :—
Pope : The Rape of the Lock.
Wordsworth : Tintern Abbey.
Shelley : Adonais
and
Browning : Andrea del Sarto.

Prose I—
Burke : Selections, edited by A. M. D. Hughes (Oxford).
Lamb : Essays of Elia, First Series, edited by A. H. Thompson (C. U. P.)

For perusal.

Scott : Bride of Lammermoor.

Prose II—
Newman : Literary Selections (Longmans).
Pater : Selections edited by Rawlinson.

For perusal.

George Eliot : Romola.
Meredith : Evan Harrington.

SANSKRIT.

1932.

PART II.

The same as for 1931

PART III, GROUP (v).

The same as for 1931.

RELATED SUBJECT.

The same as for 1931.

Note.—Under Shakespeare, the Old Regulation and the Transitory Regulation candidates will study only the *three plays prescribed under the New Regulations and not the life and work of the author as under old Regulations.

The question papers will be common to all candidates in Shakespeare and Modern Poetry, and the papers in Prose and Composition will be different.

MARATHI.

1932.

Part II.

For Non-detailed Study—

Moropantachi Kavita by Vishnu Shastri Chiplunkar.

For History of Language—

1. Maharashtra Saraswat—Part I—3rd Edition.
2. Marathi Bhashhechi Ghatana by R. B. Joshi.

For Detailed Study—

1. Panipatachi Bakhar, edited by Rao Bahadur K. N. Sane, B.A.
2. Nibandha Sangraha Grantha Dusara—Essays Nos. 1, 2, 3, 7, 8 and 9 only.
3. Krishna Vijaya Uttarardha—Chapters 1—10.
4. Harivilas by Waman Pandit, edited by B.A. Bhide, B.A.
5. Uttara Rama Charitra by Parashurampant Tatya Godbole.

The above books can be had at New Kitab Khana, Poona City, or Messrs. Parachure Puranick and Company, 'Madhava Bagh', Bombay.

Part III, Group (v).

The same as for 1931.

Related Subject.

The same as for 1931.

ORIYA

1932.

Part II.

The same as for 1931.

Part III, Group (v).

In addition to the books prescribed for 1931, the following books are recommended for consultation in History of Language and Literature and Comparative Grammar.

1. Oriya Sahityare Itihasa by B. Misra.
2. Utkal Sahityare Itihasa by T. Ratha.
3. Oriya Bhashare Itihasa by B. Misra.
4. Oriya Bhasa Tatwa by G. Nanda.
5. Comparative Grammar of Gaudian languages by Dr Hoernile.

The above books can be had at "The Mukur Press, Cuttack", or at the "Trading Company, Cuttack", or at "The Students' Stores, Berhampur, (Ganjam District.)"

RELATED SUBJECT.

1. Prachina Utkala by Jagabandhu Singh.
2. Utkala Itihasa by Kripasindhu Misra.
3. W. W. Hunter's Orissa—Vol. II, pp. 1—173.

Books recommended for consultation—

"Orissa in the Making" by Bijavachandra Mazumdar—with a Foreword by H. E. Sir Edward Gait (1925)—published by the Calcutta University.

"Introductory Essays" in B. C. Mazumdar's "Typical Selections from Oriya Literature" (3 Vols, published by the Calcutta University (1925)).

HINDI

1932.

PART II.

The same as for 1931.

LATIN.

1932.

PART II.

Virgil :	Aeneid I.
Horace :	Odes III, 1—20.
Cicero :	Pro Lege Manilia
Tacitus :	Annals I.

PART III, GROUP (v)

Plautus :	Rudens.
Virgil :	Aenied II.
Horace :	Epistles I.
Juvenal :	Satires VII and X.
Cicero :	De Officiis.
Livy :	History V.
Tacitus :	Agricola and Germania.

RELATED SUBJECT.

The same as for 1931.

FRENCH.

1932.

PART II.

Faguet : Ce que disent les Livres.
Hémond : Maria Chapdelaine.
Bordeaux : Le Barrage. (Available at 8 Rue Garanciere, 6 c, Paris).
A. Watson Bain : French Poetry for advanced students, Nos. 1-100.

PART III, GROUP (v).

Corneille : le Cid.
Molière : le Malade Imaginaire.
The Oxford Book of French Verse.
La Bruyère : Les Caractères.
Thierry : Les Normands en Angleterre.
Bazin : Mme. de Corantine.

RELATED SUBJECT.

The same as for 1931.

GERMAN

1932.

Part II.

Goethe: Egmont.
Droste—Hulshoff, Die Judenbuche (Oxford University Press.)

A Book of German Verse, edited with Introduction, etc., by H. G. Fiedler, for use in Schools and Colleges, published by the Clarendon Press, Oxford (Nos. 1—50 inclusive).

PART III, GROUP (v).

Texts will be prescribed, if required.

ARABIC, PERSIAN AND URDU.

1932.

Arabic—

PART II.

Kitabul Mahasin-Wal-Azdad.
Diwan-i-'Antra.—till the end of "Dal".
Qawa-'idul-Lughatil 'Arabiyyah—whole.
History of Literature :—Arabic Literature in the first two centuries of Islam.

Persian—

PART II.

Sarma-ya-i-Danish—Prose portions only.
Shahid-i-Nazm—Poetry.
Misbahul Qawa'id.
History of Persian Literature.—Persian Literature under Safavi dynasty.

Urdu—

PART II.

Mazamin-i-Sharar—Volume II—Part II—Historical and Geographical.

Kulliyat-i-Akbar-Part III.

Jalaluddin Khawarzim Shah.

Asas-i-Urdu.

History of Literature :—

From Sawda to Ghalib—both inclusive.

Arabic—

PART III—GROUP (v).

Tarikhu-Àdabil Lughat-il-'Arabiyyah by J. Zaydan—First 186 pages.

Ahmad-bin-Tulun by Zydan.

Mu'allaqut of Tarafa and Zuhayr—the Radif Alif of Diwan-ul-Multanabhi.

Al Quran—Surahs—Maryam and Taha.

The following books are recommended for study :—

Palmer's Arabic Grammar.

Majmu'l Adab by Yaziji.

Literary History of the Arabs by Nicholson.

Persian—

PART III—GROUP (v).

The same as for 1931.

RELATED SUBJECT.

Arabic and Persian.

The Moors in Spain.

Urdu—

PART III—GROUP (v).

Mazamini-Sharar—Part VI *i.e.*

Hindustan Mayn Mashriqi Tamaddun, Ka Akhri Namunah—Guzishta Lucknow.

Hamari Sha'ri by Masood Hasan.

Poems of Iqbal—Shikwa Jawab-i-Shikwa.

Sham' Awr Sha'ir, Khizar-i-Rah, and

Tulu'-i-Islam.

Tawbatun-Nasuh.

Kulliyat-i-Muhsin from pages 72 to 189.

The following books are recommended for study :—

Qawa-i-d-i-Urdu by Abdul Haq.

Tarikh-i-Adab-i-Urdu.

Tashilul-Balaghat.

Related Subject.

The same as for 1931.

TAMIL

1932

Part II.

Poetry.

Selections to be published by the University :—

Kurunthogai	...	25 Stanzas.
குறுந்தொகை		
Agananuru	...	10 Stanzas.
அகநானூறு		
Tirukkural (Porutpal)	...	10 Chapters.
திருக்குறள் பொருட்பால்		
Chilappadikaram	...	Adaikkalakkathai.
சிலப்பதிகாரம்		அடைக்கலக்காதை
Kambaramayanam	...	Veedanan Adaikkalam.
கம்ப ராமாயணம்		வீடணன் அடைக்கலம்
Periyapuranam	...	Kannappa Nayanar Puranam.
பெரிய புராணம்		கண்ணப்ப நாயனார் புராணம்
Kandapuranam	...	Valliyammai Thirumanam.
கந்தபுராணம்		வள்ளியம்மை திருமணம்
Tiruvarangathandadi	...	20 Stanzas.
திருவரங்கத்தந்தாதி		
Kasikkalambakam	...	about 50 Stanzas.
காசிக்கலம்பகம்		

Prose

Detailed Study--

Chilappadikara Araichi, by Mr. R. P. Setu Pillai (Ottrumai Office. Saidapet.)

சிலப்பதிகார ஆராய்ச்சி

Kapilar, by Mr. M. Venkataswami Nattar, Trichinopoly.

கபிலர்

Non-detailed Study—

Sakuntala by Dewan Bahadur S. Bhavanandam Pillai.

சகுந்தலை

Tamil Varalaru, Part I, II by late Rao Bahadur K. S. Srinivasa Pillai.

தமிழ் வரலாறு

PART III, GROUP (v).

The same as for 1931.

RELATED SUBJECT.

The same as for 1931.

TELUGU

1932

PART II.

Poetry—

		Verses
1.	Bharatamu—Udyogaparvamu—By Tikkanna—Sanjayarayabharamu—verses 229 to 385 ...	156
2.	Nrusimha Puranamu—By Errapragada—Canto I—verses 1-150 ...	150
3.	Haravilasamu—By Sreenadha—II Canto—Verses 1—200 ...	200
4.	Sringara Kadambari—By Ch. Narasimha Sastry—V Canto—verses 1—144 ...	144
	Total number of verses ...	650

Drama—

Uttararamacharita—By Vedam Venkataraya Sastry

Prose—

		PAGES
1.	Bharatasaramu—By N. Kuppuswamiah—Chapters I-VI ...	200
2.	Radhangadutamu—By Korada Ramachandra Sastry, (published by K. Ramakrishnayya, O. R. Institute, Royapettah). ..	50
3	Sumanomanognamu—By Vaddadi Subbarayudu, (Rajahmundry) ...	150
	Total number of pages ...	400

Non-detailed—

1. Bag Jaargal—By Pingali Lakshmikantam, Lecturer in Telugu, Andhra University, Waltair.
2. Tilakamanjari—By Akundi Venkata Sastri Garu, Vizianagaram.
3. Adhyatma Ramayanamu—by M. Subhadramma.

Books recommended for Grammar and Prosody—

1. Margopadesika—By Vajjhala Chinnasitarama Sastri Garu O. R. Institute, Limbdi Gardens, Royapettah, Madras.
2. Balavyakaranamu—By Chinnayya Suri.
3. Telugu Kavyadarsamu—By Avvari Subramanya Sastri, Kovvur, W. Godavari.
4. Kavijanasrayamu—By Bhimanna.
5. Chandas Sastramu—by T. Rajagopala Rao, Christian College, Madras.

PART III, GROUP (V).

Poetry—

1. Bharatamu—Keechakavadha—By Tikkanna
2. Kumarasambhavamu—By Nannichodha ... II Canto
3. Kasikhandamu—By Sreenadha ... VI ,,
4. Vasucharitramu—By Ramaraja Bhushana ... III ,,
5. Yayaticharitra—By Ponnaganti Thelaganna ... III ,,
6. Harichandra Nalopakyanamu—By Ramaraja—Bhushana ... III ,,

Drama—

1. Prabhodhachandrodayam—By Vaddadi Subbarayudu, (Rajahmundry.)
2. Gayopakhyanamu—By Chilakamarti Lakshminarasimham.

Prose—

Dasakumaracharitram—By Y. Sanjeevarayudu—Published by Messrs. Vavilla Ramaswamy Sastrulu & Sons.

Inscriptions—

1. Bezwada Yuddha Malluni Sasanamu.
2. Chalukya Sasanamu—Published in Bharati (Andhra Patrika Office.)

Literary Criticism.—

1. Kavitha Tatva Vicharamu—By C. Ramalinga Reddi.
2. Vasucharitra Vimarsanam—By Vajjhala Chinnasitarama Sastri, (Vavilla Ramaswami Sastrulu & Sons, Madras.)

History of Literature—

1. Andhra Vangmaya Charitra—By Vanguri Subba Rau.
2. Andhrakavulacharitra—By K. Veeresalingam—(Part I (Revised) and (Part II.), (Hitakarini Samaj, Rajahmundry.)

B.A. DEGREE EXAMN.—1932.

History of Language—

Bashothpatthi Kramamu—By K. Ramakrishnayya, M.A., O.R. Institute, Royapettah.

Grammar, Prosody and Poetics—

1. Balavyakaranam—By Chinnaya Suri.
2. Proudha Vyakaranam—By B. Sitarama Charlu.
3. Appakaviyamu—Cantos III and IV.
4. Narasabhupaliyamu—By Bhattu Murti.
5. Dasarupakamu—By Malladi Suryanarayana Sastri, (Rajahmundry.)
6. Chandas Sastramu—by T. Rajagopala Rao, Christian College, Madras.

RELATED SUBJECT.

The same as for 1931.

KANARESE

1932.

PART II.

For detailed Study :—

1. Vikramarjuna Vijaya (Pampa Bharata) Academy Edition-Chapters 1 & 2.
2. Sabara Sankara Vilasa by Shadakshara Deva-Chapters 1 & 2.
3. Jagannatha Vijaya by Rudra Bhatta—Chapters 1 & 2.

(1–3: Vishwakarnataka Publishing House, Chikpet, Bangalore City.)

4. Nagananda Nataka by N. Ananthanarayana Sastri (Chandrika Book Stall, Mysore).

or

Swapna Vasavadatta by Pandit M. D. Alasingaracharya, Presidency College, Madras.

5. Karnataka Kavi charitre by R. Narasimhachar, Vol. II—17th Century & Introduction.

For Non-detailed study :—

1. Chandragupta Chakravarti by A. Venkat Rao, B.A., L.T., (People's Printing & Publishing House, Triplicane, Madras).
2. Rajasimha by B. Venkatachar.
3. Bandha Vimochane by K. L. Subba Rao.

(2–3: Vishwakarnataka Publishing House, Chikpet, Bangalore City.)

PART III, GROUP (v).

The same as for 1931.

RELATED SUBJECT.

The same as for 1931.

MALAYALAM

1932.

PART—II

1st Paper—(3 hrs. duration.)

Prose—

Keraleswaran—by T. Raman Nambessan, M.A., L.T., Tutor to Maharajah of Travancore, Trivandram.

II *Paper—Poetry.* (3 *hrs. duration.*)

1. Krishnagatha—Swargarohanam—Mangalodayam Press, Trichur.
2. Kuchēla Vritham & Krishna Vilasam—Edited with introduction and notes by C. Achyuta Menon, B.A., O. R. Institute, University of Madras.
3. Kapōthasandesam—by Otattil Kesava Menon, Vakil, Muvattupuzha, N. Travancore.

Drama—

Pratimānatakam by K. Kesavan Nair, Maharajah's College, Ernakulam.

Prose—

1. Vicharavichi—edited by C. Achyuta Menon, B.A.,—Published by the Kamalalaya Press, Ottapalam, S. Malabar.
2. Ezuthachan—by R. Narayana Panikkar, B.A., L.T., Head Master, Vernacular High School, Trivandrum.

PART III—GROUP (V).

Poetry—

1. Bhāratam—Bhishma Parvam—by Ezuthachan, University Selections for B.A., Vol. II, Part II.
2. Kālakēyavadham—Kathakali—Kottayath Thampuran—Any Press.
3. Chitrayōgam—By Vallathole, I and II Sargams—A.R.P. Press, Kunnamkulam, Cochin State.

Prose—

1. Kāvyasāram—by K. Parameswaran Pillai, M.A., Nantiyār Veetu, Trivandrum.
2. Bhutarayar—By Appan Thampuran, Ayyanthole Palace, Trichur.

Drama—

Mritchakatikam by Varavoor Samu Menon, to be had of Varavoor Narayana Menon, Pandit, Victoria College, Palghat.

Old Poetry—

1. Rama Charitam—1 to 5 Patalams. University Selections for B.A. Part I.
2. Kannassa Ramayanam—Bala Kāntam 1 to 96 Slokas—edited by K. Parameswaran Pillai, M.A., Nantyār Veetu, Trivandrum.
3. Krishnagātha—from the beginning up to Vatsastheyam—Mangalodayam Press, Trichur.
4. Kirātham—Prabandham by Mepathur Bhatathiripad. (Published by P. V. Krishna Varier, Kottakkal, South Malabar.)

RELATED SUBJECT.

Dravidian Languages.

The same as for 1931.

B. A. DEGREE EXAMINATION, 1933.

*ENGLISH.

1933.

Shakespeare.—

King Lear.

A Midsummer Night's Dream.

Plays for General Reading:—

Richard II.

Antony and Cleopatra.

The Tempest.

Poetry.—

Paradise Lost, Book II.

The Rape of the Lock.

The following Selections from "Longer Poems of the Nineteenth Century". 1st Series (Blackie).

Wordsworth: Ode on Intimations of Immortality.

Byron: Rome (from Childe Harold—Canto 4).

Shelley: The Sensitive Plant.

Prose I.—

Burke, Selections; edited by A. M. D. Hughes (Clarendon Press).

Johnson's Preface to Shakespeare (obtainable in the Oxford Miscellany Series, Oxford University Press).

For Non-detailed Study.—

Pride and Prejudice.

Prose II.—

Carlyle's Essays on Burns and Johnson (Blackie).

Pater: Selections: edited by Rawlinson (Macmillan & Co.).

or

Ruskin: Unto this Last.

For Non-detailed Study.—

Great Expectations.

The English Voyages of the 16th Century, Raleigh (Agents, Macmillan & Co., Mount Road, Madras).

SANSKRIT.

1933

PART II.

The same as for 1932.

* See note on page 152.

PART III—GROUP (v).

The same as for old Group VI—1932, and Keith's Classical Sanskrit Literature—Heritage of India Series to be added to the list of books recommended for study against (c) History of Sanskrit Literature.

MARATHI.

1933

Part II.

For Non-detailed Study.—

1. Neeti Shastra Vichar by Gogate.

2. Nibandha Sangraha Grantha Dusara—Essays Nos. 2, 4, 5, 9, 10 and 13.

For Detailed Study.—

Prose.—

1. Shivchhatrapati's life by Sabhasada.

2. Vichar Vilas by V. M. Joshi, M.A., pp. 1—140.

Poetry.—

1. Duyaneswari—Chapter III.

2. Hari Vilas edited by B.A. Bhide, B.A.

3. Krishna Vijaya (Uttarardha) by Moropant—Chapters 55—64.

Drama.—

Tratika by Kelkar.

For History of Language and Literature and Comparative Grammar:—

1. Maharashtra Saraswat—Part I—3rd Edition.
2. Marathi Bhashhechi Ghatana by R. B. Joshi.

The above books can be had at Messrs. Parachure Puranick and Company, 'Madhava Bagh', Bombay.

PART III—GROUP (v).

Prose.—

1. Kesarilit Nivadaka Nibandha, Part I, by N. C. Kelkar.

2. Life of Thorale Shahu Maharaj by M. R. Chitnis.

Poetry.—

1. Woman:—Niti and Vairagya. Shatakas and Gangalahari.

2. Moropant:—Krishna Vijaya (Uttarardha)—Chapters 50—59.

Drama.—

Agarkar's Vikaravilasita.

The above books can be had at Messrs. Parachure Puranick and Company, 'Madhava Bagh', Bombay.

History—Group (*v*).

RELATED SUBJECT, 1933.

Rise of the Maratha Power by M. G. Ranade.

Grand Duff's History of the Marathas.

The above books can be had at Messrs. Parachure Puranick and Company, 'Madhava Bagh', Bombay.

ORIYA.

1933

Part II.

For Non-detailed Study.—

Bhagavata Tungi by Gopalachandra Praharaj.

For Detailed Study.—

Prose.—

1. "Prabandha Prakasa" by Ratnakara Pati.
2. "Atma Jeebani" by Pakhirmohan Senapati.

Poetry.—

1. Rahasya Manjari by Deva Durlabha Das. (Prachi Granthamala Series).
2. Konarke, Part II "Mayadevi" by Nilakantha Das.

Drama.—

"Purushottama Deba Natak" by Godavarish Misra.

For History of Language and Literature and Comparative Grammar:—

Byakaruna Prabesa by Radhanath Rai.

Part III—Group (v).

Classical Poetry.—

Kotibrahmanda Sundari, Cantos 1 to 10, by Upendra Bhanja.

Modern Poetry—

1. "Maharajatra" by Radhanath Rai.
2. "Vikramaditya" by Chintamoni Mahanty.

Purana—

1. Kiskindhya Kanda by Krushnacharan Patnaik.
2. Bhagavata Panchama Skandha by Jaganath Das.

Drama—

Panchali Pattapaharana by Radhamohan Rajesdra Deo.

Books for consultation—

1. Oriya Sahityare Itihasa by B. Misra.
2. Utkal Sahityare Itihasa by T. Ratha.
3. Oriya Bhashare Itihasa by B. Misra.
4. Oriya Bhasa Tatwa by G. Nanda.
5. Comparative Grammar of Gaudian languages by Dr. Hoernile.

History—Group (v).

RELATED SUBJECT—1933.

Books prescribed—

1. Prachina Utkala by Jagabandhu Singh.
2. Utkala Itihasa by Kripasindhu Misra.
3. W. W. Hunter's History of Orissa, Volume II, pp. 1—173.

Books recommended for consultation—

1. Orissa in the making by Vijayachandra Muzumdar with a foreword by His Excellency Sir Edward Gait, published by the Calcutta University.
2. Introductory essays, in B.C. Muzumdar's Typical Selections from Oriya Literature—3 Volumes published by the Calcutta University.

The above books can be had at "The Mukur Press, Cuttack", or at the "Trading Company, Cuttack", or at the "Students' Stores, Berhampur, (Ganjam District)".

Hindi.

1933

PART II.

The same as for 1932.

ARABIC AND PERSIAN FOR B.A. DEGREE EXAMINATION, 1933.

LATIN.

1933

PART II.

Cicero: Pro Lege Manilia.
Tacitus: Annals, Book I.
Horace: Odes, Book II.
Virgil: Aeneid VIII.

PART III—GROUP (v).

Texts will be prescribed, if required.

FRENCH.

1933

PART II.

H. Bordeaux: Le Barrage.

R. Bazin: Mme. Corentine } (Nelson.)
French Short Stories }

Watson Bain's Selection of French Poetry for Advanced Students, Nos. 1—100

PART III—GROUP (v).

The same as for 1932.

GERMAN.

1933

PART II.

The same as for 1932.

PART III—GROUP (v).

Text-books will be prescribed, if required.

ARABIC.

1933

PART II.

The same as for 1932.

PERSIAN.

1933

PART II.

Prose.—

Sarmaya-i-Danish—Prose portions only.
Rah-i-Naw—Iranshihar Publications.

Poetry.—

Shahid-i-Nazm.

Grammar.—

Mishahul Qawa'id.

Note.—For History of Literature—Persian Literature under Safavi Dynasty.

URDU.

1933

PART II.

Prose.—

Mazamin-i-Farhat—Part II.

Poetry.—

Kulliyathi-Akbar—Part III.

Non-detailed.—

Mazamini-i-Sharar, Volume II—Part II—Historical and Geographical.

Grammar.—

Asasi-Urdu.

History of Literature.—

Tarikh-i-Adabi—Urdu—Portions prescribed for 1932.

HEBREW.

1933

PARTS II AND III—GROUP (V).

The same as for 1932.

ARABIC.

Part III—Group (v).

Tarikhu-Adabil-Lughatil 'Arabiyyah by Jurji Zaydan—First 186 pages.

Majaniul-Adab—Part IV.

Mu'allaqat by Imra'ul Qays, Tarafa and Zuhayr.

Al-Qur'an—Surahs Yusuf and Maryam.

The following books are recommended for Grammar, etc.—

1. Palmer's Arabic Grammar excluding Prosody.
2. Majmu'ul Adab by Al-yaziji for Rhetoric and Prosody
3. Literary History of the Arabs by Nicholson.

PERSIAN.

PART III—GROUP (v).

Qissa-i-Haji, Baba Isfahani—First half.

Payam-i-Mashriq.

Mathnavi by Rumi—First quarter of Part I.

Sih Nathar by Zahuri—First Nathar only.

Qasa 'id-i-Qa-ani (Radif Alif only). Edited by Ja'fari.

The following books are recommended for Grammar, etc.—

Khazinatul Fawa'id—Part 2.

Literary History of Persia by Brown.

URDU.

PART III—GROUP (v).

Adabi Khutut-i-Ghalib by Mirza Askari.

Hamari Sha'iri.

Kulliyathi—Muhsin from pages 72 to 189.

Poems of Iqbal—Shaikwa, Jawab-i-Shikwah, Sham'a Awr Sha'ir, Khizar-i-Rah and Tulu'-i-Islam.

Kulliyathi-Akbar—Vol. II, first half.

Tawhatun Nasuh.

The following books are recommended for Grammar, etc.—

Qwa-'idi—Urdu by Abdul Haq.

Tarikh-i-Adabi—Urdu.

Tashilul—Balaghat.

RELATED SUBJECT FOR ARABIC AND PERSIAN.

The Abhaside Caliphate excluding Africa and Spain and the wars of the Crusades.

RELATED SUBJECT FOR URDU.

The Later Three Mughals.

RELATED LANGUAGE.

PERSIAN.

Quissa-i-Haji Baha Asfahani.

ARABIC.

Majaniul-Adab—Vol. IV.

TAMIL.

1933

Part II.

Poetry—

Selections published by the University:—

Kural—Porutpal 10	..	100
Nedunalvadai	..	120
Kalithogai—10 stanzas	..	150
Chintamani—Govindayarilambakam	..	320
Manimekalai—Athirai Pichaiyittapadalam	..	150
Kambaramayanam—Valivadaippadalam	..	500
Periyapuranam—Karaikkal Ammaiyar	..	500
Kachikkalambakam	..	150
Pari Venba by Mr. R. Raghava Ayyangar	..	
Purananuru—25—1 to 27	..	250
Thevaram—(Appar) 20	..	800
Kulasekarar—20	..	800

Prose (Detailed)—

Gnanasambanthar by C. Sivagnanam Pillai, (C. Coomaraswami Naidu & Sons).

Alvargalkalanilai by M. Raghava Ayyangar. (Tirumankaimannan to Kulāsekaraperumal).

Non-detailed—

Socrates—Pioneer Publishing House.

Vyasathirattu by Kandaswami Kavirayar, (E. M. Gopalakrishna Kone, Madura).

Part III—Group (v).

The same as for 1932.

TELUGU.

1933

PART II.

Poetry.—

1. Uthararamayanamu—By Kankanti Paparaju—Canto VI, Verses 197—325.
2. Pandurangamahathmyamu—By Tenali Ramakrishna Kavi, Canto III, Verses 1—113.

3. Vikramarkacharitramu by Jakkana, Canto III.

4. Vasucharitra—by Ramarajabhushana, Canto I, from Kathaprarambhamu to the end.

5. Ramabhyudayamu—by Iyyalaraju Ramabhadrudu, Canto III.

Drama.—

1. Sree Rama Pattabhishekamu—by Pathalabhedi Subramanya Kavi, Tirupathi.

Prose.—

1. Harsha Charitramu—By M. V. Ramanachari.

2. Neethichandrika—By Rao Bahadur K. Veerasalingam Pantulu—Sandhi.

3. Sahitya Mimamsa—by Sreepada Kameswara Sastri.

Non-detailed.—

1. Dharmasamrajyamu—By Vidwan Ganti Jogi Somayajulu.

2. Soundaryathilaka—By Chilakamarthy Lakshminarasimham—Part I

Books recommended for Grammar, Prosody and Poetics.—

The same as for 1932.

PART III—GROUP (v).

The same as for 1932.

KANARESE.

1933

Part II.

For Detailed Study.—

(1) Vikramarjuna Vijaya by Pampa, (Kannada Academy Edn.). 12th Aswasa.

(2) Jagannatha Vijaya by Rudra Bhatta, Chapters 3 and 4, (Mysore Oriental Library Edition).

(3) Sabara Sankara Vilasa by Shadakshara Deva, Chapters 3 and 4.

(4) Aswathhaman by B. M. Srikantiah, M.A., B.L.,—(Nos. 1 to 4—available at the Viswakarnataka Publishing House, Chickpet, Bangalore).

(5) Hidimbe, by K. Sankara Bhatta, (Bala Sahitya Mandala, Ltd., Mangalore).

(6) Veni Samhara Nataka by Jayarayacharya, (Viswakarnataka Publishing House, Chickpet, Bangalore).

(7) Karnataka Kavicharite by R. Narasimhacharya, Vol. I—pp. 1 to 114 (up to the end of the 11th Century) with introduction. (Author, Malleswaram, Bangalore).

For Non-detailed Study—

(1) Ananda Matha by B. Venkatacharya, (Visvakarnataka Publishing House, Chickpet, Bangalore).

(2) Karma Kathe by Galaganath, (the author, Haveri, Dharwar District).

PART III—GROUP (v).

The same as for 1932.

MALAYALAM.

1933

Part II.

For Composition and Translation—3 hours paper.

1. Keralachakravarthi Udayamarthandan, by G. R. Venkitavarada Ayyangar, Vidvan (A.R.V. Press, Fort, Trivandrum.)

2. Ramaraja Bahadur, by C. V. Raman Pillai, B.A., (B. V. Book-Depot, Trivandrum.)

Poetry (detailed).

1. Sthree Parvam—Bharatam—Ezhuthachan—Any Press.

2. Nalacharitam—Kathakali, II & III Day's Plays.

3. Mayoorasandesam by Keralavarma Koil Thampuran, (Edition by A.R. Raja Raja Varma, B.V. Book Depot, Trivandrum.)

4. Rugmangadacharitam—6th and last sargams-by Pandalam Kerala Varma, (S. R. Book Depot, Trivandrum.)

Drama :—

5. Rugmini Parinayam, by A.D. Harisarma, c/o Deepam Office, Ernakulam, Cochin State.

Prose:—

1. Thunchath Ezhuthachan by P. K. Narayana Pillai, B.A., B.L., Judge, Trivandrum, (Sri Rama Vilasam Press, Quilon).

2. Vijnana Deepika, Part I, by Ulloor S. Paramesvara Ayyar, M.A., B.L., Trivandrum.

PART III—GROUP (v).

The same as for 1932.

APPENDIX IV

B.A. (HONOURS) DEGREE EXAMINATION SYLLABUS.

Branch (i)—Mathematics—B.A. (Hons.)

It is hereby notified that the following is the list of subjects from which special subjects are to be selected under each of the divisions specified in Chapter XXXVII, Regulation 14 (i) (c).

Note.—The Board of Studies may from time to time add to the list or exclude subjects from the list, either temporarily or permanently.

1. *Geometry*—
   - (1) Advanced Projective Geometry.
   - (2) Non-Euclidian Geometry.
   - (3) Higher Plane Curves.
   - (4) Differential Geometry.

2. *Algebra*—
   - (1) Finite Groups and Substitutions.
   - (2) Invariants.
   - (3) Statistics including Probabilities and Errors of Observation.

3. *General Theory of Functions*—
   - (1) Functions of real variables.
   - (2) Theory of Uniform Functions of a complex variable and integral functions.
   - (3) Function of a complex variable after Riemann including Riemann's surfaces.

4. *Differential Equations*—
   - (1) Linear Differential Equations.
   - (2) Partial Differential Equations.

5. *Special Functions*—
   - (1) Elliptic Functions.
   - (2) Functions of Harmonic Analysis.

B. Sc. (Hons.)

It is hereby notified that the following is the list of subjects from which special subjects are to be selected under each of the divisions specified in Chapter XLI, Regulation 2 (i) (c).

Note.—The Board of Studies may from time to time add to the list or exclude subjects from the list, either temporarily or permanently.

1. *Dynamics*—
   (1) Advanced Rigid Dynamics.
   (2) Theoretical Dynamics.

2. *Astronomy*—
   (1) Planetary and Lunar Theories.
   (2) Physical and Practical.

3. *The Potentials.*

4. *Elasticity.*

5. *Hydrodynamics and Sound*—
   (1) Irratational motion in liquids.
   (2) Propagation of sound in gases.

6. *Heat*—
   (1) Conduction of Heat.
   (2) Thermodynamics.
   (3) Kinetic Theory of gases.

(1) GENERAL.

Including Pure Geometry and Analytical Geometry of two and three Dimensions:—

(*a*) *Geometry of Two Dimensions.*—

The metrical properties of the point, the straight line, the circle, the parabola, the ellipse and the hyperbola treated by pure geometric methods, by means of Cartesian co-ordinates, polar co-ordinates and homogeneous co-ordinates (chiefly areal and trilinear).

Cross Ratios, Harmonic Section, Involution ranges and pencils. Perspective. Principle of duality. Reciprocation with respect to conics. Line Co-ordinates, application of tangential equations to conics. The method of projection, considered from the pure geometric point of view, its analytic basis. The principle of continuity, imaginary points and lines. Projective properties of conics. Simple geometric applications of invariants of conics.

(*b*) *Geometry of Three Dimensions*

The line, the plane and the regular solids treated by pure geometrical methods.

Analytical Geometry of three dimensions with Cartesian Co-ordinates.—The Straight line, the Plane, the Sphere, the Cone, the Quadrics, their plane sections and generating lines. Confocal Quadrics. The reduction of the general equation of the second degree.

A. *Books for Study*—

1. Askwith: Pure Geometry.
2. W. P. Milne: Projective Geometry.
3. Smith: Conic Sections.
4. Askwith: Analytical Geometry of the Conic Sections.
5. C. Smith: Solid Geometry.
6. R. J. T. Bell: Co-ordinate Geometry of three Dimensions.
7. Hall and Stevens: School Geometry, Part VI.
8. Nixon: Geometry in space.

B. *Books for Reference*—

1. C. V. Durell: Plane Geometry for Advanced Students.
2. J. W. Russell: Pure Geometry.
3. Milne: Homogeneous Co-ordinates.
4. Salmon: Conic Sections.
5. Frost: Solid Geometry.

(2) ALGEBRA AND THEORY OF EQUATIONS.

Inequalities and Limits. Convergence and divergence of Series and of Infinite Products. Binomial and Exponential Theorems. Logarithmic series. Summation of series. Continued fractions, simple and recurring; indeterminate equations. Theory of numbers. Elementary propositions in Probability. (Standard as in C. Smith's Algebra).

Theory of equations.—Relations between the roots and coefficients. Symmetric functions of the roots, transformation of equations; binomal and reciprocal equations; properties of derived functions. Rolle's theorem. Location of the roots. Sturm's theorem. Algebraical solution of cubic and biquadratic equations: solution of numerical equations. Horner's method. Graphical solution of equations. Determinants and Elimination. (Standard as in Burnside and Panton).

(3) PLANE TRIGONOMETRY.

Fuller treatment of the B.A. Course. Properties of triangles and quadrilaterals. Complex Numbers. De Moivre's Theorem and Applications. Factorisation, Infinite series, convergence of complex series. The Power series. Trigonometrical expansions. Determination of π Summation of Series Elementary properties of hyperbolic functions. Convergency

of Infinite Production. Expression for the sine and cosine as infinite products.

(Standard as in Loney's Trigonometry and treatment as in Hobson's Plane Trigonometry.)

(4) MATHEMATICAL ANALYSIS.

including the Differential and Integral Calculus and Differential Equations:—

1. *Preliminary*

Irrational numbers, simple notions as to their genesis obtained from the intuitional properties of the straight line. The linear continuum. Infinite sequences, limiting points, upper and lower limits. General principle of convergence. General idea of a function of a real variable, the elementary functions and their graphical treatment. Limits of functions of a continuous variable, continuity of functions, properties of continuous functions. Inverse functions, proof of existence when original function is steadily increasing or decreasing.

2. *Differential and Integral Calculus.*

Functions of one real variable. Derivatives, general theorems and rules for differentiation, repeated differentiation, Leibnitz's theorem, general theorems concerning derivatives. Rolle's theorem, mean value theorem. Geometrical applications of derivatives. Integration as the operation inverse to differentiation, standard forms and processes of integration. The general mean value theorem of the differential calculus, applications to maxima and minima, to evaluation of limits, and to contact of plane curves. Envelopes, Curvature. Taylor's series convergence of the standard Taylor series. Integration of bounded functions according to Riemann, integrability of continuous functions and monotonic functions, the fundamental theorem of the integral calculus. The first and second mean value theorems of the integral calculus. Functions defined by definite integrals, their continuity, differentiation and integration. Applications of definite integrals.

Functions of several real variables. continuity, Implicit functions, idea of their existence (without proof). Partial derivatives, differentiation of implicit functions and composite functions, Euler's theorem on homogeneous functions, Taylor's theorem for functions of several variables, simple applications to maxima and minima, and to the finding of singular points and asymptotes of algebraic curves. Double integrals, line integrals, surface integrals, and triple integrals—evaluation in simple cases. Green's theorem. Geometric applications of multiple integrals.

Simple instance of functions of a complex variable Caushy's theorem (proof by use of Green's theorem).

3. *Infinite Series and Infinite Integrals.*

Series of positive terms. Simpler tests of convergence. Series of positive and negative terms, Abel's and Dirichlet's tests. Absolute convergence, effect of change of order of terms on sum. Absolutely convergent double series. Multiplication of absolutely convergent series.

Series of variable terms. Uniform Convergence, Weierstrass's M-test, chief properties of uniformly convergent series as regards continuity, differentiation and integration. Fundamental properties of power series, standard power series. Fourier series of bounded functions with a finite number of maxima and minima and a finite number of discontinuities. Infinite products, the standard infinite products.

Infinite integrals. Functions defined by infinite integrals. Uniformly convergent integrals, their continuity, sufficient conditions for differentiating and integrating under the sign of integration, simple applications to the evaluation of infinite integrals.

4. *Differential Equations*

(*A*) *Ordinary Differential Equations involving two variables.*—

Formation of differential equations, character of solutions, geometrical meaning of differential equations.

Equations of first order.—Variables separable, linear equation. Bernoulli's equation, homogeneous equation, one variable absent, $Mdx+Ndy=0$, integrating factors and their discovery in the simpler cases. Equations of nth degree that can be resolved into component equations of 1st degree, equations solvable for x or for y, Clairaut's form. Singular solutions, the p- and c-∠ discriminants, geometric interpretation.

Linear equations with constant co-efficients; Euler's linear equations. Exact equations.

The equations $y(x)=f \angle (x), y(n) = f(y), y(n)=f\left\{y\ (n-1)\right\}, y\ (n)= f\left\{y\ (n-2)\right\}$ Depression of order when one variable is absent.

Equations of second order.—The complete solution in terms of known integral relation between integrals.

Geometric applications; finding of curves ∠ with given properties, trajectories.

(*B*) *Ordinary Differential Equations involving more than two variables*:—

Simultaneous linear differential equations, the equation $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$ and its geometrical interpretation. Total differential equations (with three variables), the condition of integrability, geometric interpretation of the equation and its solution.

(C) *Partial Differential Equations :—*

Their derivation, classification of integrals of a partial differential equation, geometric interpretation. Lagrange's equation $Pp+Qq=R$, Charpit's method. The standard forms $\psi(p, q)=0$, $\psi(z, p, q)=0$, $\phi(x, p)=\psi(y, q)$ and $z=px+qy+\phi(p, q)$.

Standard as in the following books:—

1. H. Lamb: Infinitesimal Calculus.
2. Gibson: Elementary Treatise on the Calculus.
3. Murray: Introductory Course in Differential Equations.
4. Carslaw: Fourier Series.
5. Edwards: Differential Calculus.

Books for Reference—

1. G. H. Hardy: Pure Mathematics.
2. Goursat-Hedrick: Mathematical Analysis, Vol. I.
3. Wilson: Advanced Calculus.
4. Chrystal: Algebra, Vol. II.
5. Bromwich: Infinite Series.
6. Forsyth: Treatise on Differential Equations.
7. Boole: Differential Equations.
8. Williamson: Differential Calculus and Integral Calculus
9. Jordan: Cours d'Analyse.
10. Picard: Traite d'Analyse.
11. Piaggio: Differential Equations.

(5) DYNAMICS OF PARTICLE.

Preliminary

Velocity and acceleration, relative motion, angular velocity, laws of motion, impulsive forces Units.

Rectilinear Motion.

Equations of motion, simple harmonic motion constant disturbing force, periodic disturbing force, damped and forced oscillations: various laws of resistance.

Motion in two Dimensions

(1) *Cartesian Co-ordinates.*—Composition of simple harmonic motions, motion of a projectile in vacuum, in a resisting medium, different laws of resistance. Equation of energy. Rotation axes

(2) *Polar Co-ordinates.*—Velocity and acceleration in polar co-ordinates. Central forces: differential equation of

orbit, orbits for various laws of force. Disturbed circular orbit; apses. Law of the inverse square; construction of orbit; hodograph, time of describing an arc; Kepler's law, correction to 3rd law; perturbations.

(3) *Constrained Motion.*—Tangential and normal accelerations. Motion on a fixed smooth or rough curve. Motion in a smooth or rough cycloids, motion in a circle, time of describing an arc, series for time of oscillation; small oscillations of simple pendulum under resistance proportional to square of velocity. Motion on a revolving curve; motion of a particle in a revolving tube.

(4) *Motion of two or more Particles.*—Principles of conservation of energy and of angular momentum. Two particles connected by a string passing over a pulley. Impulses, motion of a chain, motion of varying mass.

(6) DYNAMICS OF A RIGID BODY.

Moments and products of inertia; momental ellipsoid, momental ellipse, equimomental systems. Principal axes. D'Alembert's principle, general equations of motion. Independence of translation and rotation. Impulsive forces.

Motion about a fixed axis.—Fundamental theorem. The compound pendulum, centre of oscillation. Torsional oscillations, bifilar suspension. Pressures on the fixed axis, bodies, symmetrical and not symmetrical. The ballistic pendulum. Impulsive forces, centre of percussion.

Motion in two Dimensions.—Finite forces. General principles of conservation of energy and of linear and angular momentum. Systems with one degree of freedom, oscillations about equilibrium. Impulsive forces, impact of a rotating sphere on the ground. Lagrange's equations, systems of two degrees of freedom, double pendulum, oscillations about equilibrium.

Standard as in the following books:—

Lamb's Dynamics.

Loney's Dynamics.

Besant and Ramsay's Dynamics.

Williamson and Tarleton's Dynamics.

Books for Reference—

Love's Theoretical Mechanics.
Routh's Dynamics of a Particle.
Tait and Steel's Dynamics.
Routh's Elementary Rigid Dynamics.

(7) STATICS.

Forces at a point.—Parallelogram of forces. Parallelepiped of forces. Geometric and analytical reduction of forces acting at a point. Conditions of equilibrium of such forces. Friction Equilibrium of a particle on smooth and rough curves and surfaces.

Forces in one plane.—Parallel forces. Theory of moments of forces and of couples; reduction of coplanar forces and conditions of equilibrium of such forces. Actions at smooth and rough hinges and joints. Principle of virtual work as applied to coplanar forces. Astatic equilibrium.

Graphical Statics.—Centres of gravity of arc, plane area, surface, and solid. Stable and unstable equilibrium. Machines with and without friction.

Forces in three dimensions acting on a rigid body.—Reduction of such forces to a force and a couple; General conditions of equilibrium; Principle of work applied to any system of forces. Work or Potential function. Stable and unstable equilibrium. Poinsot's central axis; wrench, screw; resultant wrench of two given wrenches. The cylindroid. Reciprocal screws. Reduction of any system to the forces. Conjugate lines. Nul lines and nul planes.

Equilibrium of strings.—General conditions of equilibrium of an inextensible string. The common catenary, the parabola of suspension bridge, the catenary of uniform strength; strings on smooth surfaces and curves, strings on rough curves; strings under central forces, extensible string.

Standard as in—

Loney's Statics.

Books for reference—

Minchin's Statics, Vol. I and Vol. II, Chapters XIII—XV.

Routh's Analytical Statics, Vol. I.

(8) HYDROSTATICS.

Definitions of 'perfect fluid' and 'pressure at a point.' Equality of pressure at a point in all directions: general conditions of equilibrium of a fluid and of a liquid in particular. Fluid at rest under the action of (1) gravity, (2) central forces. Rotating liquid.

Resultant thrusts of fluid on plane areas. Centre of pressure. Thrust of liquid on curved surfaces.

General condition of equilibrium of a floating body. Surfaces of buoyancy and flotation. Positions of equilibrium. Potential energy stored up by the immersion of a solid.

Stable and unstable equilibrium of a floating body. Metacentre; expression for metacentric height. Experimental determination of metacentric height; stability of equilibrium (1) of a hallow vessel containing a liquid floating in another liquid; (2) of bodies floating under constraint; (3) of bodies floating in heterogenous liquid (simple cases only); theory of stability based on the principle of energy.

Standard as in—

Besant and Ramsay's Hydrostatics, Chapters I—V.

Minchin's Hydrostatics excepting Chapter on Surface tension.

Books for Reference—

Greenhill's Hydrostatics.

(9) ASTRONOMY—*General and Elementary Spherical.*

The celestial sphere, astronomical co-ordinates.

The diurnal motion of the heavenly bodies and its explanation by rotation of the Earth. Arguments and proofs for the Earth's rotation. Change of phenomena due to a change of the observer's place on the Earth. Form and size of the Earth. Simple problems connected with the diurnal motion solved by using spherical trigonometry.

The apparent motion of the Sun among the stars. Variations in the length of the day at various places. Twilight. Explanation of the phenomena on the supposition of the annual motion of the Earth round the Sun and proofs for this hypothesis. The determination of the first point of Aries and the obliquity of the Ecliptic. The signs of the Zodiac. Effects of Precession and Nutation.

The Earth's orbit round the Sun. Kepler's laws and Newton's deductions therefrom. True anomaly, mean anomaly and the lengths of the different seasons.

Finding by observation the latitude and longitude of a place, and the error of the clock.

Different units of time and the conversion of one into another. Sundial, Equation of time. Different kinds of years. The Calendar.

Corrections of observations for astronomical refraction, parallax and aberration and the fundamental formulæ embodying these corrections. Determination of parallax of heavenly bodies and their distances.

The Moon. Its orbit round the Earth and the Sun. Its rotation and liberations. Synodic and Sidereal months. Eclipses, and their causes. Ecliptic limits. Number of eclipses in a year. The Saros.

Members of the solar system. Elements of a planet's orbit. Direct and retrograde motions of the planets. Phases of the planets. Transits of planets across the Sun. Comets and meteors.

Principal constellations and stars. Double and multiple stars. Binary Stars. Nebulae.

The observatory. The principal instruments—The astronomical clock. Transit Instrument. The transit Theodolite. Equatorial. Sextant. The principal errors of the Transit Instrument and their corrections.

Text-books recommended for Study—

(1) Barlow and Bryan's Astronomy.

(2) Young's General Astronomy.

(3) Moulton's Introduction to Astronomy.

(4) Ball's Spherical Astronomy (*easier parts*).

Books for Reference—

(1) Ball's Spherical Astronomy.

(2) Newcomb's Spherical Astronomy.

(3) H. S. Jones's General Astronomy.

(10) STATISTICS.

including Probabilities and Errors of Observation:—

PROBABILITIES *a priori*:—

Mathematical definition: elementary theorems and examples. Addition and multiplication of probabilities, with examples. Binomial distribution and the most probable event. Mathematical expectation.

A posteriori or Inverse:—Bayes's Rule and its criticisms.

THEORY OF VARIABLES (*a*) *Symmetrical Frequency distribution.*—

Errors, different kinds, nature of accidental errors.

Gauss's Law of Error; its proof based on the nature of accidental error. Error curve.

The law of least squares and deduction of the principle of arithmetical mean. Proof of law of error based on the principle of arithmetical mean. The median and the law of error based on the median. Application to one unknown; measure of precision, mean square error, probable error. Observations of different weights. Adjustment of indirect observations involving one unknown and more than one unknown. Normal equations, their formation and solution. Probable error of an observation of unit weight. Probable errors of unknowns and determination of their weights. Adjustment of conditioned observations. Rejection of observations.

(b) *Asymmetrical Frequency-distribution—*

The median, mode, standard deviation. Method of moments to derive a formula to fit a particular statistical experience. Curve fitting (Pearson's curves). Skewness; Theory of Dispersion.

(c) *Frequency-distribution of two variable—*

Correlation and Contingency tables and their representation by surfaces. Correlation: regression: correlation coefficient and correlation ratio.

(d) *Frequency distribution of several variables—Partial correlation.*

THEORY OF SAMPLING:—Normal correlation.

THEORY OF ATTRIBUTES:—Classification, consistency, association: partial association.

GENERAL STATISTICAL METHODS WITH ILLUSTRATIONS.

THE PRINCIPLES OF INDEX-NUMBER MAKING AND USING.

(a) *Books recommended for study*:—(1) Fisher: 'Theory of Probabilities.' (2) Chrystal: chapter on 'Probabilities' in his Algebra. (3) L. D. Weld: 'Theory of errors and least squares.' (4) David Brunt; 'Combination of observation.' (5) Udny Yule: 'Theory of Statistics.' (6) D. C. Jones's.' 'First Course in Statistics.' 'Frequency curves and Correlation.' (7) Bowley: 'Elements of Statistics.'

(b) *Books for Reference.*—(1) Elderton. (2) Secrest: Statistical Methods.' (3) King: 'Elements of Statistical Method. (4) Karl Pearson's memoirs in 'Biometrika,' 'Phil.—Trans.' and 'Phil.—Mag.' (5) The article on Probabilities in the 'Encyclopaedia Britannica.'

(11) THEORY OF UNIFORM FUNCTIONS OF A COMPLEX VARIABLE AND INTEGRAL FUNCTIONS.

General Theory.

Complex numbers, their geometric representation. DeMoivre's Theorem. Definition of a function of a complex variable, uniformity and multiformity of functions. Analytic functions, the Cauchy-Riemann definition, the differential equations satisfied by the real and imaginary parts of an analytic function. Conformal representation of one plane on another complete discussion of the transformations

$u=\frac{az+b}{cz+d}$, $u=z^n$ (n positive integer), $u=e^z$ (with simple variations.)

Cauchy's Theorem for simple contours and functions which are analytic inside and on the contour. The fundamental formula $f(x) = \frac{1}{2\pi i}\int\frac{f(z)}{z-x}dz$. Taylor's series, Liouville's theorem. Laurent's expansion. Point at infinity, development in its domain. Weierstrass's theorem on the asymptotic behaviour in the domain of an isolated essential singularity. Weierstrass's theorem on a series of analytic functions. Fundamental theorem on residues with simple applications, including evaluation of simple definite integrals.

Weierstrass's theorem on the infinite product expression for an integral function. Mittag-Leffler's theorem on the expression of a function with isolated singularities as a series of rational functions.

Simple periodic functions, expansion of an integral simple periodic function. The impossibility of a uniform analytic function having three independent periods. Elliptic functions, their general properties about the sum of the residues, the number of zeros and the number of poles, the difference between the sum of the zeros and the sum of the poles in a parallelogram of periods; algebraic relation between elliptic functions of the same periods. The Weierstrassian function $P(u)$ and its fundamental properties.

The fundamental properties of power series of a complex variable, elements of an analytic function, the process of analytic continuation, Weierstrass's conception of an analytic function. Singular points, their place in the Weierstrassian Theory. Functions with natural boundaries, simple examples.

Integral Functions.

Weierstrass's fundamental theorem, notion of genus.

The λ-index (Borel's real order), the μ-index and the v-index (Borel's apparent order) of an integral function of finite order, $\mu = \frac{1}{\lambda}$. For a canonical product $v \leq \lambda$. Hadamard's Theorems : (i) the relation between $\log M(r)$ and the density of the distribution of the zeros ; (ii) for every integral function of finite order $\lambda \leq v$; (iii) regarding the minimum values of $M(r)$ on a series of concentric circles extending to infinity ; (iv) for an integral function of finite order for which v is not an integer $\lambda = v$.

The following books, in so far as they deal with the subject matter given in the syllabus, are recommended.

FOR B.A. (HONS.) DEGREE EXAMINATION.

A. Books for study:—

1. Goursat: Mathematical Analysis—Vol. II, Part I.
2. Vivanti and Gutzmer: Theorie der eindeutigen analytischen Funktionen.
3. Borel: Lecons sur la Theorie des Fonctions entiers.
4. Durege: Theory of Functions.
5. Watson: Complex Integration and Cauchy's Theorem.
6. McRobert: Theory of Functions.
7. Harkness and Morley: Introduction to the Theory of Analytic Functions.

B. Books for reference:—

1. Forsyth: Theory of Functions.
2. Whittaker and Watson: Modern Analysis.

(12) ORDINARY LINEAR DIFFERENTIAL EQUATIONS.

(A) *Elementary Methods of Integration.*—Equations of the first order, standard forms, Bernoulli's and Riccati's equations. Integrating factories. General linear equation of the *n*th order and properties, depression of order, adjoint equation. Special forms: with constant co-efficients, Euler's equation, Laplace's equation, exact differential equation. The general linear differential equation of the 2nd order; various methods of integration, normal form. Trajectories.

(B) *The Theory of Linear Differential Equations.*—Existence theorems. Equation of the first order, system of linear equations of the first order, homogeneous linear equation of the *n*th order. First integrals, Jacobi's multipliers. Fundamental systems of integrals, the △ ‡ ○ criterions. Regular integrals. Study of integrals near a singular point; form and properties, permutation of integrals. The fundamental equation; formal expression of the integrals when all the roots of the fundamental equation are distinct; expression in logarithmic form of the set of integrals corresponding to a repeated root of multiplicity. Fuchs's Theorem on the form of a homogenous linear equation having all its integrals regular near a singularity, and its converse. Frobenius's method of integration for equations of the 2nd order and application to Legendre's and Bessel's equations and to the equation of the hypergeometric series.

(C) *Higher methods of integration.*—Integration by series with simple applications to Legendre's equation, Bessel's equation, and the equation of the hypergeometric series. Solution by definite integrals of Laplace's equation and Bessel's equation,

Systems of linear equations with constant variable co-efficients.

Standard to be found in:—

(A)	Forsyth's Treatise	Chapters II—IV
	Goursat	Chapters II—III
(B)	Forsyth's Theory, Vol. IV,	Chapter I nearly complete.
		Chapters II-III greatly restricted.
	Goursat	Chapters II-III
(C)	Forsyth's Treatise	Chapters V, VII and Chapter VIII restricted.
	Goursat	Chapter III.

Books recommended:—

A. R. Forsyth: (1) Treatise on Differential Equations.
(2) Theory of Differential Equations. Part III, Vol. IV.

Goursat's Mathematical Analysis, Vol. II, Part II (English Translation).

Jordan: Cours d' Analysis, Vol. III.

Laurent: Traite d' Analyse, Tome V.

Picard: Traite d' Analyse, Tome III.

Schlesinger: Handbuch der Theorie der linearen Differential gleichungen.

(13) CONDUCTION OF HEAT.

General differential equation for isotropic bodies and for homogeneous bodies. Boundary conditions, uniqueness of solution.

Isothermal surfaces in homogeneous infinite solid. Solution in the following cases of isotropic bodies.

(A) *The Linear Flow.—Complete study.* (1) The infinite solid. (2) The semi-infinite solid; various problems in constant, variable and periodic temperature at the surface, with application to terrestrial temperature. Reduction of the problem of cooling by radiation to the problem of cooling by conduction. (3) The finite rod, including Fourier's ring. Solution by Fourier's series for constant, variable and periodic temperature at the surface. Angstrom's method for finding conductivity experimentally. (4) Heat sources, instantaneous and continuous; application to semi-infinite solid, finite rod, and Fou-

rier's ring, when there is no radiation (5) Application of Green's function in heat to simple cases of linear flow. not including radiation.

(B) *The flow in more than one dimension.—Simple study.* Simple cases of steady and variable temperature for infinite solid, semi-infinite solid and finite rod. Application of conjugate functions to problems of steady temperature in two dimensions.

(C) *Radial flow.*—The infinite and semi-infinite circular cylinder with or without radiation, initial temperature being constant or a function of the distance only. The sphere, with or without radiation, initial temperature being a function of the distance only. Spherical surface source.

(D) *Conduction of heat in crystalline bodies.*

Standard to be found in Carslaw:—

Chapters IX—XIV nearly complete.

Chapters XV—XVIII greatly restricted.

Books recommended:—

(1) H. S. Carslaw:—Mathematical theory of the conduction of heat.

(2) J. Boussinesq:—Theorie Analytique de la chaleur.

(3) H. Poincare:—Theorie Analytique de la propagation de la chaleur.

(4) L. R. Ingersoll and O. J. Sobel:—An Introduction to the Mathematical Theory of Heat Conduction.

(5) Fourier:—Theorie Analytique de la Chaleur (English translation by Freeman.)

(6) Preston:—Theory of Heat.

Branch II.

*PHILOSOPHY.

Note.—For the M.A. Degree Examination the work prescribed does not include the optional subjects (numbered below as (6) (*a*)—(*f*) defined in connection with the Honours Degree Examination.

*The Syllabuses and text-books in Philosophy printed in these pages are for the B.A. (Hons.) Degree Examinations of 1932 & 1933 under the Old Regulations. The syllabuses and text-books under the revised Regulations for the examinations of 1934 are under preparation and will be published later.

(1) Syllabus in Logic and Theory of Knowledge—

(A) Knowledge and Thought

1. Postulates of knowledge, formal and material. Relation between logical theory and functional psychology, including a detailed consideration of the antecedent conditions, datum and content of Judgment. Unity and continuity of intellectual life.

2. The central function of the knowledge-process. Image, idea and meaning as factors in logical thought. Thought and language. Names and their import. Extension and intension of terms and the doctrine of their inverse relation.

3. Nature of judgment. The various theories of judgment. Unity of judgment. Varieties of judgment and their affiliation. Negation and disjunction.

4. Nature of inference. The various theories of inference. Induction. Enumerative induction and analogy.

5. Scientific induction by perceptive analysis. Value of Mill's Experimental Methods as methods of proof.

6. Scientific induction by hypothesis. Different forms of explanation.

7. The varieties of deductive inference. Relation between induction and deduction. Classification of the sciences. Fallacies.

8. Necessity in knowledge.

(B) Knowledge and Reality

Relation of knowledge to truth and reality. The criterion of truth. Error. Theories of the relativity of knowledge. The conception of degrees of truth and reality. The ideal of knowledge.

(2) (a) Syllabus in Psychology.—

The Psychology of the Thought Processes.—

1. Evolution of the Thought Processes.

   i. Thinking an acquired reaction.

   ii. Relation between psychoses and neuroses.

   iii. Thinking as an adaptive function.

2. Inter-relation between cognitive and other conscious processes.

   i. Sensori-motor and ideo-motor circuits.

   ii. Attention and interest.

   iii. Affective determinants of thought.

3. The Perceptual Processes.

   i. Perception of qualities—relation to sensory processes.

   ii. Perception of spatial and temporal relations.

   iii. Perception of meanings.

   iv. Errors of perception.

4. Intelligence.

   i. Classification of Intelligence.

   ii. Complexity of intelligence.

   iii. Is intelligence general or specific?

   iv. Relation to the acquirement of knowledge.

5. Imagination.

   i. Relation of perception and imagination.

   ii. The nature and function of imagery.

   iii. Is imageless thinking possible?

   iv. Anticipation and recollection.

   v. Delusions, Hallucinations, Day-Dreaming.

6. Association.

   i. Neural basis.

   ii. Criticism of associationism.

   iii. The associative tendencies.

   iv. Free and controlled association.

   v. Conflict and Repression.

   vi. Dissociation.

7. The Learning Process.

i. Animal and human learning compared.

ii. Method of trial and error.

iii. Learning by observation and practice.

iv. Effect of fatigue.

v. The curve of learning.

vi. The transfer of learning.

8. Remembering and forgetting.

i. Relation to imagination and association.

ii. Memorizing, recall, retention and recognition.

iii. Mental incubation.

iv. How we forget.

9. The acquirement of meanings, and formation of concepts.

i. Can meaning be analyzed into images?

ii. Analysis, comparison, synthesis, abstraction—formation of concepts.

iii. The function of language.

10. Reasoning and the judgment.

i. A problem-solving operation.

ii. Organisation of mental data.

iii. Relation to concepts and meanings.

iv. Types of judgments: practical and logical.

v. Scientific thinking.

vi. Conative factors: relation to choice.

11. The relation between Psychology and Logic.

i. Noegenetic principles: eduction of relations and eduction of correlates.

ii. Range of relations.

iii. Types of correlation: deduction and induction.

12. Belief and doubt.

i. Conative basis.

ii. The attitudes.

iii. Social determinations.

iv. Systems of beliefs.

v. The function of criticism.

(2) (b) Syllabus in Ethics—

1. Scope and method of Ethics. Relation to other sciences.

2. The beginnings and growth of morality—custom; conscience; systematic reflection.

3. Moral development of the individual—Childhood; adolescence; 'conversion'; 'temptation'; fixation of character. The moral and the religious life.

4. Psychology of Ethics—Analysis of the moral judgment: the situation which provokes it; the course it follows; the function of moral criteria. Motive; intention; character.

5. Constructive theory—Good and moral good. Obligation. Casuistry. The moral ideal. Discussion of the principal virtues. The moral significance of institutions: the family; the state; property and rights; punishment.

6. Critical study of ethical thought—General characteristics of Indian, Greek and European morality. Ethical systems—hedonistic, rationalistic, psychological, idealistic.

7. Metaphysics of Ethics—The ultimate validity of moral judgment. Free will and responsibility. Morality and religion.

(3) Syllabus in European Philosophy—

A.—From Thales to the Neo-Platonists.

This period being commonly studied in the first year of the student's Honours course, it is recommended that the method of teaching should in this case be by exposition and criticism of a text-book. W. T. Stace's 'A Critical History of Greek Philosophy' is suggested as suitable for the purpose.

B.—From the Middle Ages to Hume.

Rapid survey of Scholasticism, with special reference to the controversy between Realists and Nominalists. Brief characterization of the Renaissance. Influence on philosophy of the discovery of the laws of motion and the rise of the experimental method. Critical study of the conflicting factors in the philosophical thought of Descartes and of Spinoza. The consummation of Rationalism in Leibniz. Critical study of the rise, development and bankruptcy of "The Way of Ideas" as exhibited in the teaching of Locke, Berkeley and Hume.

C.—From Kant to Hegel.

Kant's relation to Leibniz and to Hume. Nature of the Transcendental or Critical Method. Brief description of the problem and the conclusions of the Transcendental Æsthetic. The Metaphysical Deduction of the Categories—a brief characterization. Careful exposition of the gist of (*a*) the Transcendental Deduction of the Categories, and (*b*) the First and Second Analogies. Subjectivism and phenomenalism in Kant. The sceptical and idealist tendencies distinguishable in the Transcendental Dialectic. Brief exposition of Kant's treatment of the Paralogisms, the Antinomies and the Proofs for the Being of God. Relation between the Critiques of Pure and of Practical Reason. The reality of freedom. General problem of the Critique of Judgment. Kant's hypothetical reconciliation of mechanism and teleology. Critical study of Fichte's way of transforming the Kantian phenomenalism into an absolute idealism. Brief description of Schelling's advance upon Fichte. Hegel's criticism of Fichte and Schelling. Careful exposition of the significance of Hegel's identification of logic and metaphysics. Brief statement of the nature of the tasks to which he addressed himself respectively in the Phenomenology, the Logic, and the Philosophies of Nature and of Spirit. Understanding and Reason. Abstract and concrete. The Dialectic, Principle. Relation of the Dialectical evolution to time. The Real and the Rational. Alleged Intellectualism of the Hegelian system.

(4) Syllabus in Outlines of Indian Philosophy—

I. *Historical Antecedents.*—The world conception characteristic of the Mantra period. Germs of philosophic thought in the later hymns. Development of ritualism in the Brahmanas. Ritual as the means of attaining the ideal of enjoyment here and in Svarga.

II. *Rise and development of the main currents of Speculation.*—Subordination of ritual to knowledge in the Upaniṣads due to change of ideal. Tendency of the early Upaniṣads towards Pantheistic Monism. Germs of Sānkhyan thought. Karma and Re-birth. Conception of deliverance. Jnāna and Dyāna as means for its attainment.

(*a*) Theism of the later Upaniṣads and the Gīta. The liberal attitude of the Gīta in respect of means of salvation. Ethics and Metaphysics of the Gīta. Germs of other philosophical schools in the later Upaniṣads and the Gīta.

(*b*) Jainism and Buddhism. Their independence of authority. Their rejection of single Supreme Being. Universality of Law and Suffering. Karma and Re-birth. Buddha's view of Nirvāṇa. His rejection of ritual. His emphasis on ethical life as the only means of salvation. Buddhistic Logic, Psychology and Ethics. The Jaina emphasis on *Samyagjnāna*, *Samyagdarsana* and *Caritra*.

III. *Resultant Systems.*—Issue of the above speculative tendencies in well-defined schools of thought: formation of Sûtras.

(*A*) Logical Prolegomena: the study of the Pramāṇas, Pratyakhsa and Anumāna, and an investigation of the nature of cause and causal relation.

(*B*) A comparative and critical study: (1) Materialistic, (2) Rationalistic and (3) Supra-rationalistic systems.

(1) *Materialistic.*—The system of the Cārvakās. Perception, the only test of reality. Denial of the Supersensible. Denial of the validity of inference. Denial of the causal relation. Four elements. Mind, only a function of matter. Denial of any real connexion between virtue and happiness, vice and misery. Artha and Kāma as only ends of life.

(2) *Rationalistic.*—The Buddhistic schools. Their common features. Kṣaṇabhangavāda, as Ātmabhanga-vāda and Bāhyārthabhanga-vāda. The Ātmakhyāti-vāda of the Yōgacāras. The Bāhyārthānumēya-vāda of the Sautrāntikas. The Bāhyārthapratyakṣa-vāda of the Vaibhāsikas. The Sūnya-vāda of the Madhyāmikas. Samvriti-Satya.

(3) *Supra-rationalistic* systems, accepting the authority of the Vēdas.

(i) *The Nyāya and the Vaiseṣika.*—Their standpoints. Their theory of cognition. Theory of atoms. Conception of God as extra-cosmic and personal. Relation of God to the Universe. Nature of the soul and its final destiny. Relation of the individual soul to God. Conception of Mōkṣa and the means for its attainment.

(ii) *The Sānkhya Schools* (*Sānkhya and Yōga*).—View of cognition. Conception of reality. Causality, Cosmology and Psychology of the Sānkhyas. The doctrine of the plurality of souls: Puruṣa and Prakriti, the only ultimate realities. Their nature and relation. The attitude of Kapila and Patañjali to the existence of God. Purpose of cosmic evolution. Conception of Kaivalya. Yōga the only means for its attainment. The condition of Puruṣa in Kaivalya.

(iii) *The Mimāmsa Schools* (*Pūrva Mīmāmsa and Uttara Mīmāmsa*).—Purva Mimāmsa as the systematization of the varieties of Vedic ritual. Uttara Mīmāmsa (Vēdanta) as a philosophy based entirely on the Upaniṣads. Brahman the highest reality. Brahman both upādāna and nimitta of the universe. Identity of cause and effect. Different schools of the Vēdānta.

(*a*) *Advaita.*—Theory of cognition. Conception of reality. Kinds of reality as Prātibāṣika, Vyāvahārika and Pāramārthika. Causality. Brahman, devoid of all attributes, the only Pāramārthika reality. Māya. Isvara. Avidya. Jiva. Relation of Jiva to Brahman. Avaccēda Vāda and Pratibimba Vāda. Relation of Brahman to Maya, Sālvation through the realization of Jīva's identity with Brahman. Jñana Yōga, the only direct means for its attainment.

(*b*) *Visistādvaita.*—Conception of reality. Causality. Aprthaksīdda-Sambandha (inseparable union). Plurality of souls. Personality of God. Universe an embodiment of God. The nature of soul. Its relation to God Mōkṣa. Bhakti and Prapatti the direct means of Mōkṣa. Condition of the released soul in Mōkṣa and its relation to God.

(*c*) *Dvaita.*—Its essential features. Points of difference from Visiṣtādvaita.

(*d*) *Saiva Siddhanta.*—Its essential features.

(5) **Prescribed Modern work** for 1932: Lloyd Morgan-Life, Mind and Spirit.

(6) (*a*) **The Advaita Védanta,** to be studied historically and critically.

Syllabus of Advaita Vedanta.

(A) *History* (15)—

I. Traces of Advaitic thought in the Rig Véda, Mandalas I and X.

II. Development of Advaitic thought in—

(*a*) The Upaniṣads—mainly (1) Bṛhadāranyaka—Yājñavalkya's discourses; (2) Ccāndógya—discourses addressed to Svétakétu and Indra, also Sāndilya, Upakósala. Bhūma and Dahara Vidyas; (3) Taittirīya; (4) Kēna; and (5) Māndūkya . . (3)

(*b*) Brahma-Sūtras, esp. I i, 1 to 9; II i, 14 and II 3, 50; III 2, 3 and III 2, 22.

(*c*) Bhagavad-Gīta—esp. chapters ii, v, xiii and xviii . . . . (3)

(*d*) Viṣṇu Purāna (chiefly monistic extracts considered in the Srī Bhāṣya) and Srimad-Bhagavata (Skandhas x and xi) . . . (1)

III. First systematic formulation of Advaita doctrine in Gaudapāda's Māndūkyakārikas . . . . . . (3)

IV. Classical exposition of Advaita doctrine in Sankara's work:

(*a*) Bhāṣya on Brahma-Sūtras — esp. reference in section II (*b*) and Sútra IV, 3, 14.

(*b*) Bhāṣya on Bṛhadāranyaka and Ccāndōgya (select passages).

(*c*) Vivēkacūdāmaṇi, Atmabōdha and Upadēsa Sahasri . . . . (2)

V. Rise of divergent views within the fold of Advaita.

Main topics of interest.

(*a*) Ajñāna as positive (bhāva-rūpa).

(*b*) Ekajiva-vāda and Nānājiva-vāda.

(*c*) Dṛṣti-Sṛṣti-vāda and Pratikama-vyavastha.

(*d*) Sabdaparōkṣa and Akhandārtha doctrines.

VI. Controversy with other systems — as in Madhusudana's Advaita Siddhi ... ... (1)

(*B*) ***Exposition*** (25)—

I. Relation to other Eastern systems (Buddhism, Sāṅkhya, etc.) *Cf.* Brahma-Sūtra Sankara Bhaṣya, II. 2. Relative unimportance of affinities with Western systems (Idealism, Pantheism and Monism) ... ... (3)

II. Theory of knowledge—

(*a*) The Pramāṇas or means of knowledge—importance of Sabda — Para and Apara Vidyas—nature of Jñāna and its relation to Antahkarana and vritti — Theory of pratyakṣa — intuition and inference (pratyakṣa and parōkṣa) . . (3)

(*b*) Truth and Reality and the doctrine of three kinds of Reality (satvatraya) ... ... (1)

(*c*) Nature of Adhyasa and theory of error (anirvacanīyakhyāti) ... ... (3

III. Metaphysics—

(*a*) Nature of Brahman — proofs of his existence — categories of cause and substance — transcendence (neti-neti) and immanence (antaryāmitva) — saguṇa and nirguṇa vada ... ... (3)

(*b*) Nature of Jivātman — plurality of jivas — their respective avidya, karma and upādhi — nature and proof of the identity of Brahman and Atman — bimba-pratibimba-vada and avaccdēa vada. ... ... (2)

(*c*) Nature of prapañca—theory of abhinnanimittōpādana — pariṇāmavāda and vivarta vāda — doctrine of māya ; its history and proof ; its relation to time, space and causality . . . . (2)

IV. Ethics—

(*a*) Nature of the highest good (puruṣartha)—mukti or complete freedom from māya or avidya—beyond good and evil—free from activity—positive aspects of mukti—saccidānanda—Jivanmukti and vidēhamukti ... (2

(*b*) Means of realization (sādhana)—vidya the one means—value of such other means as karma, samadamādi and upāsana—call for divine grace ... ... (3)

(*c*) Advaita and social service (lōkasangraha) ... (1)

(*d*) The ideal and the real—metaphysical warrant of moral endeavour—problem of free-will—morālity and religion— ... ... (2)

(C) *Criticism—in the light of other systems, Eastern and Western* ... ... (20)

I. Criticism of Māya or mithyatva—charge of acosmism ... ... (2)

II. Criticism of anirvacyatva or transcendence—charges of agnosticism and mysticism ... ... (2)

III. Criticism of svaprakāsatva or self-knowability—charge of subjectivism ... ... (1)

IV. Criticism of nirguna vāda—charge of absolutism. ... ... (1)

V. Criticism of abhēda vāda—charge of abstract identity ... ... (1)

VI. Criticism of jivabrahmaikya—charge of atheism and solipsism... ... ... (3)

VII. Criticism of jnānasādhana or the subordination of both bhakti and karma to jnāna—charge of intellectualism ... ... (4)

VIII. Criticism of karmasanyāsa—charges of renunciation and quietism ... ... (2)

IX. Criticism of kaivalya as a goal—charges of moral stultification and pessimism ... ... (2)

X. Criticism of Ātmarati—charge of egoism ... (1)

NOTE.—*The figures in brackets are offered as an approximate indication of the number of days which, in a course extending over* 60 *lectures, might suitably be given to the various sections and sub-sections specified.*

SYLLABUS IN SAIVA SIDDHANTA

I.—*History*

A. Traces of Saivaism in the Rig Veda, the Yajur Veda and the Atharva Veda. The ideas of *Rudra-Pasupati*, and *Stāmba*-worship.

B. (i) Development of Siddhāntic-thought or theism in—

(*a*) The upaniṣads, especially Svetāsvatara.

(*b*) The Purānas, mainly the Saivite Puranas like Sivamahāpurāna, Skānda and Vāyu.

(*c*) Itihāsas including the Gitā.

(*d*) Formulation of the system as indicated in the later Bhāṣya on the Brahma Sūtras by Nilakanṭa Sivācārya.

(*e*) Kashmiriyan Saivism—the development of the Pratyabhijnā system.

(ii) Ancient Tamil literature.

(*a*) Traces of Saivite thought in Tolkāppiyam, Tiruvalluvar and Sangam literature.

(*b*) Growth of devotional literature in the Jaina and Buddhistic period. The rise of the Samayācaryās.

(*c*) Rise of modern Saivism: The Sanātanācāryas. Systematization of worship in the Āgamas.

The fusion of the divergent currents of Saivism in the Siddhānta.

II. *Theory of knowledge*—

Pramānas—Sense—perception. Reasoning and Authority. *Para* and *apara vidyās*. Theories of Truth and Error (Pramā and *Bhrama*).

III. Metaphysics. The three ultimate Realities: Pati, Pasu and Pāsam. Their Visistādwaitic tendency.

Satkārya Vāda. The idea of causation. Criticism of other theories. Conception of God as Siva and Sakti. God as the efficient cause. Attributes of Siva and Sakti.

(*a*) Nature of *Pati*.—Criticism of *Nirguna Vāda*. Divine motherhood and the redemptive principle of grace. Criticism of the doctrine of *Avatāra*.

(*b*) Nature of Pasu:—Saiva Siddhānta psychology. Plurality of Souls—Characteristics of the Soul—Its relation to God—Soul as *Sat-asat*. Classification of soul's Avasthas.

(*c*) Nature of Pāsam.—The threefold character—Âṇava, māyā and kāmya—The Thirty-six tattvas and their relation to the Soul.

(*d*) Elements of realism in Saiva Siddhānta.

IV. *Ethics and Religion*—

(*a*) The highest *Purusártha* : *Mukti* or redemption.

(*b*) Means of attaining salvation (caryā, kriyā, yoga, jṉana, díkṣā).

(*c*) The meaning of moral and spiritual endeavour—*Karma* and redemption.

(*d*) The nature of *mukti*—*Atma Darsana* and *Siva Darsana*—Its contrast with the theistic and Advaitic ideal. (The four stages of *mukti*).

V. Critical study of the inter-relations of Saiva Siddhanta, Advaita and Viṣiṣṭādvaita; as also of the inter-relations of the various schools of Saivísm.

SYLLABUS IN VISIṢTĀDVAITA.

I. *History*—

(i) Germs of Viṣiṣtādvaita in the Rig Veda.

Development of Viṣiṣtādvaita in—

A. The Upaniṣads, especially Ghātaka Srutis.

1. Bṛhadāranyaka (Maitreya and Antaryāmi Brāhmanas)
2. Chāndogya. VI, VII, VIII Adhyāyas.
3. Taittiriya (Mahānārāyana Upanisad).
4. Svetāsvatara.
5. Katha.

B. Brahma Sūtras and the Bhagavad Gíta with the related works by Bodhāyana, Tanka, Dramida, Yamuna and Rāmānuja.

C. Vishnu Purāna II, V, VI books.

(ii) Pāncarātra. Systematization of worship in the Mahabhārata-Vedanta Sútras—The development of the Bhagavata religion and its relation to Visiṣtādvaita.

(iii) Tamil Literature—

(*a*) Growth of devotional literature, Sangam literature. The alvārs—Guruparampara, Nammalvār, the chief expounder.

(*b*) The rise of Srî Vaishavism. The earliest formulation of the system by Yamunācārya.

(iv) The fusion of the divergent currents in the Siddhanta and its classical exposition by Rāmānuja.

(v) The rise and growth of sub-systems.

(vi) Contributions of Vedānta Deśika and Pillai Lokācārya to Viśistādvaita.

II. *Theory of knowledge*—

(*a*) Pramānas or the means of knowledge—*Sabda*, *Anumana* and *Pratyakṣa*—Correlation as opposed to contradiction —Importance of Sabda—The Mīmāmsaka doctrine justified—The equal validity of all Vedic texts—The relation of Sabda to *Āptavākya* and intuition.

(*b*) *Satkāryavāda* or realism. The doctrine of Pañcīkarana (Brahma Sūtras III—i-3). The theory of the immanent causality.

(*c*) Nature of Error (*Yathārtha-khyāti*). The theory of continuity or *Avasthas* as opposed to that of contradiction (*mithyā*) The meaning of illusions and dreams in terms of ethical realism. Criticism of the doctrine of *Māyā*.

III. *Metaphysics*—

Conception of Visiṣṭādvaita ; nature of Brahman—Brahman as the immanent cause of cosmic evolution—Criticism of *Vivarta vāda*—The absolute as the self-differentiating unity and as personality—The doctrine of *aprathaksiddha-viseṣana*, Sāmānādhikaranya—Criticism of the *Nirguna vāda* —The characteristics of Brahman—The theory of incarnation—*Brahman*, *Cit* and *Acit*; eternal but not external; *Cit* and *Acit* as the *Prakāra* or mode of *Isvara*—Nature of *Acit*—Categories and characteristics—Meaning of *Suddha Sattva* or *Aprākṛta* and time.

IV. *Psychology*—

The nature of Jivātman as personality, persisting as a separate being in the four states of waking, dream, sleep and release—Its distinguishing qualities—cognition, conation and feeling (*gnatṛtvam*, *kartṛtvam*, and *bhoktṛtvam*)—The distinction between substantive intelligence (*dharmi-bhūta-jñāna*) and attributive intelligence (*dharmabhūta-jñāna*).

The Jiva as *Aṇu* or monadic as distinct from Isvara who is *Vibhu*. The three classes of souls.

V. *Ethics*—

(*a*) The moral freedom of the finite-self as a distinct personality and not a mere *viseṣaṇa*—Criticism of the mīmāṃsaka doctrine of the Vedic imperative—Moral freedom and divine necessity reconciled.

(*b*) Iṣvara as Nārāyana—Niyanta or moral ruler of the universe—The doctrine of karma—Transcendental eminence, criticism of *bhedābheda vāda*—Karma yogā as worship of God without desire for fruits—Service as the supreme good.

(*c*) Iṣvara as Nārāyana and Sri—The doctrine of redemption and grace—*Karma* and *kṛpā*, reconciled.

VI. *Religion*—

(*a*) The doctrine of *Sarira-Sariri-Sambandha*—Logical immanence and ethical transcendence, reconciled in the idea of Jīva as a body of Iṣvara—The æsthetic idea of God as *Ānandamaya*.

(*b*) Requisites of *Mumukṣutva*—Progressive spiritual discipline in *Karma yoga*, *Jnāna yoga*, *Bhakti yoga* and *Prapatti*—Karma and Jnāṇa, reconciled—The relative values of *Bhakti* and *Prapatti*.—Alvārs' mystic yearning for God.

(c) Nature of *mukti* as the highest good or freedom from *avidyā* as well as *pāpa*—Criticism of *Jīvanmukti* and *Aikyavāda*. The relative values of *kaivalya* and God-Realisation—*Dvaita* and *Advaita* (Theism and Pantheism) reconciled.

VII. *Affinities with other philosophical systems, more especially with Prābhakara and Jaina Systems.*

(b) The development of philosophy from Plato to Aristotle.

(c) The development of philosophy from Kant to Hegel.

(d) Political Philosophy.

(e) Syllabus in the Philosophy of Religion—

Introductory—

(1) The Problem and Task.

(2) Methodology.

(3) Special Problems of a Philosophy of Religion.

I. The History of Religions—

(1) Animism—

(a) Origins.

(b) Development.

(2) Totemism—

(a) The totemic group

(b) Organization.

(c) Exogamy.

(3) Fetichism.

(4) Magic and Taboo—

(a) Definition.

(b) Functions.

(c) Relation to religion.

(5) The cult and its various developments.

(6) Tribal religions.

(7) National religions.

(8) Universal religions.

II. The Psychology of religion—

1. The psychological Characteristics of religion—
   - (*a*) An attitude and a technique.
   - (*b*) Social experience.
   - (*c*) Faith rather than proof.
   - (*d*) Interpretation and evaluation.

2. The Psychological function of religion—
   - (*a*) Satisfaction for felt needs.
   - (*b*) Opportunities for overt motor activities.
   - (*c*) Consciousness of fellowship in collective life, both human and extra-human.

3. The Psychological Phenomena of the religious life—
   - (*a*) A sense of dependence—from magic to religion
   - (*b*) Rites and ceremonies—the cult and its power.
   - (*c*) Belief—the doctrine and the dogma—from animism to ethical theism.
   - (*d*) Religious persons—shamans, prophets and priests.
   - (*e*) Religious objects.

4. The Development of religion in human experience—basis of the attitude—
   - (*a*) In the race.
   - (*b*) In the individual.

5. The Development of religion in human experience—
   - (*a*) The religion of childhood.
   - (*b*) Adolescence and its religious experiences.
   - (*c*) The religion of mature minds.

6. The Psychology of religious practices—
   - (*a*) Prayer.
   - (*b*) Mythology.
   - (*c*) Sacred texts.
   - (*d*) Worship and the collective life.

7. The Psychology of Mysticism—
   - (*a*) Various types of mysticism.
   - (*b*) The place of ecstasy.
   - (*c*) The Mystic life.
   - (*d*) The worth of mystic experience.

III. The Logic of religion—

1. The Problem of definition—
   - (*a*) Facts to be reckoned with.
   - (*b*) Individualistic definitions.
   - (*c*) Sociological definitions.

2. The relation of religion to science—
   - (*a*) Genetically.
   - (*b*) Functionally.

3. The relation of religion to morality—
   - (*a*) Historical associations.
   - (*b*) Reality and the moral and religious consciousness.

IV. The Epistemology of religion—

1. The validity of religious knowledge.
2. The subject-object relationship in religious knowledge
3. Theories of religious knowledge—
   - (*a*) Revelation and authority.
   - (*b*) Idealism.
   - (*c*) Experience.
4. The significance of doubt.
5. The dilemma of agnosticism.
6. The function of faith as a way to know truth and reality.

V. The Metaphysics of religion—

1. The ultimate Nature of Reality—
   - (*a*) Mechanism and teleology.
   - (*b*) Naturalism and agnosticism.
   - (*c*) The unity of reality, truth and value.

2. Evidence for the Existence of God—
   - (*a*) The concept of God is symbolical and anthropomorphic.
   - (*b*) The teleological argument.
   - (*c*) The argument from religious experience.
   - (*d*) The moral ideal and hope of immortality.
   - (*e*) Pragmatic arguments.
   - (*f*) Arguments against belief in God.

3. The Problem of Evil and the Character of God—

(*a*) Transcendence and creationism.

(*b*) Immanence and pantheism.

(*c*) Goodness and infinity.

(*d*) Doctrine of a finite God.

(*e*) Idealistic conceptions: absolute and personal.

4. God and Human Freedom—

(*a*) Determinism and indeterminism.

(*b*) Reality and worth of the Moral life.

(f) Syllabus in Experimental Psychology—

1. The psycho-physical methods. Methods of treating series of observations—average, median, mean variation. Graphic methods.

2. Cutaneous sensations. The compass test and localization.

3. Visual sensations. Colour vision. Mixture. After-Images. Contrast. Visual perception of space. Binocular vision. Illusions.

4. Auditory sensations. Binaural audition.

5. Gustatory and olfactory sensations.

6. Discrimination of movements and of lifted weights. The size-weight illusion.

7. Sensory acuity.

8. Weber's law.

9. Reaction times: simple and complex. Estimation of interval of time.

10. Experimental investigation of memory and association.

11. Mental work. Fatigue and practice.

12. Feeling. Its expression.

In connexion with the respective subjects of examination the following courses of reading are suggested, but in no sense prescribed :—

1. *Logic*—

Bosanquet: Logic or the Morphology of Knowledge. Deway: Studies in Logical Theory, Chapters I to V, VIII. Joachim: The Nature of Truth.

PHILOSOPHY FOR B.A. (HONS.) DEGREE EXAMINATION.

2. (*a*) *Psychology*—

Spearman: Nature of Intelligence and Principles of cognition.

Dewey: How We Think.

Miller: The Psychology of Thinking.

Meumann: The Psychology of Learning.

Titchner: Experimental Psychology of the Thought Processes.

Pilsbury: The Psychology of Reasoning.

Rignano: The Psychology of Reasoning.

Pear: Remembering and Forgetting.

Edgell: Theories of Memory.

McDougall: Outlines of Psychology.

„ Outlines of Abnormal Psychology.

2. (*b*) *Ethics*—

Dewey and Tufts: Ethics.

Stuart: Valuation as Logical Process (in Dewey: Studies in Logical Theory).

Croce: Philosophy of the Practical.

Green: Prolegomena to Ethics, Books II and III.

Munsterberg: The Eternal Values, Chapters I to VI. XI. C; XII. C.

Moore: Principia Ethica, Chapters I to IV.

Bradley: Appearance and Reality, Chapter XXV.

Mezes: Ethics: Descriptive and Explanatory.

Rogers: Short History of Ethics.

John Mackenzie: Hindu Ethics.

Hopkins: The Ethics of India.

Bradley: Ethical Studies.

3. *European Philosophy*—

Rogers: Students' History of Philosophy.

Adamson: Development of Greek Philosophy.

Adamson: Development of Modern Philosophy.

Rand: Modern Classical Philosophers, pp. 381 to 420. 583 to 588.

Croce: What is Living and What is Dead of the Philosophy of Hegel.

4. *Indian Philosophy*—

Bloomfield: The Religion of the Vēda.

Deussen: The Philosophy of the Upanishads.

Max Muller: Six Systems of Indian Philosophy.

Sarva Darsana Sangraha (translation by Cowell and Gough).

Davies: Hindu Philosophy. The Sankhya Karikas of Isvara Krṣna.

Chatterjee: Indian Realism.

Thibaut: The Introduction to his translation of the Vēdanta Sūtras (S.B.E., Vol. XXXIV).

Mrs. Rhys Davids: Buddhism.

Radhakrishnan: Indian Philosophy. Two volumes.

Das Gupta: History of Indian Philosophy.

Hume: Thirteen Principal Upanishads.

Ranade: A constructive Survey of Upanishadic Philosophy (Poona: The Oriental Book Agency).

A. B. Keith: Sankhya.

A. B. Keith: Karma.

A. B. Keith: Mimamsa.

A. B. Keith: Indian Logic.

A. B. Keith: Buddhist Philosophy.

A. B. Keith: Religion and Philosophy of the Vedas and the Upanishads, 2 vols. (Harward Oriental Series).

P. T. Srinivasa Ayyangar: Outlines of Indian Philosophy.

A. A. Macdonell: India's Past. (Oxford University Press)

PHILOSOPHY FOR B.A. (HONS.)
DEGREE EXAMINATION.

S. S. Suryanarayana Sastri: Sivadvaita of **Srikantha.**

P. N. Srinivasachari: Ramanuja's Idea of the **Finite** Self, (Longmans).

S. Venkataramiah (Ed.) Khatopanishad **(Macmillan).**

5. *Prescribed Modern work*—

For 1932; Lloyd Morgan—Life, Mind and Spirit.

6. (a) *Optionals.*—

(1) *Adwaita Vedanta*—

Brihadaranyaka and Cchandōgya Upanishads, with Sankaras commentaries (English translation, edited by V.C. Seshachariar, Mylapore).

Bhagavadgīta, with Sankara's commentary (translation by Mahadeva Sastri).

Gaudapāda's Karikas on the Mandūkyōpanisad (English translation).

Deussen : The System of the Vēdanta.

Shastri : The Doctrine of Māya.

Urquhart : Pantheism and the value of life.

(2) *Saiva Siddhanta*—

1. Sivajñānabodam with the Bhāshya of Sivajñāna Swamigal.
2. Sivajñāna Siddiar.
3. Siddhānta Aṣtakam by Umāpati Sivāchārya.
4. Jñānamritam.
5. Siddhānta Sarāvali.
6. Brahma Sûtras with Nilakantha's commentary and Appayya Dīkshta's Sivārkamani Dīpika.
7. Devotional literature like Tevāram, Tiruvasakam, and Tirumantram.
8. Siva Tattva Vivekam.
9. Kashmiriyan Saivism Series, more especially Abhinavagupta's works and 'Kashmiriyan Saivism.'
10. Siva and Sakthi by Sir John Woodroffe.

(3) *Visishtadwaita—*

1. Vedartha Saṅgraha.
2. Srībhāshya (Introduction I—IV. Dr. Thibaut's Translation).
3. Gītābhāsya.
4. The 6,000 padi for Nammalvar's Tiruvāymoli.
5. Theism in mediaeval India (Carpenter).
6. Indian Theism (McNicol).
7. Vaishnavism (Bhandarkar).
8. Vaishnavite Saints (Rajagopālāchariyar).
9. History of South Indian Vaisnavism (Dr. S. Krishnaswami Ayyangar).
10. Rahasya Traya Sāra, chapters 2-6.
11. Tatva Traya.

(b) *Ancient European Philosophy—*

Plato: Republic, Protagoras and Phaedo (translations published in Golden Treasury Series).

Aristotle: Metaphysics, Bk. I (transl. by A. E. Taylor)

Aristotle: Nicomaehean Ethics (transl. by F. H. Peters).

Wallace: Outlines of the Philosophy of Aristotle.

Grote: History of Greece, Chapters 67 and 68.

(c) *Modern European Philosophy—*

The selection from Kant's Critiques of Pure and Practical Reason in Rand: Modern Classical Philosophers, pp. 376 to 485.

The selections from Kant's Critique of Judgment in Watson: Selections from Kant, pp. 307 to 349.

The first six Chapters of Hegel's Logic in Wallace. The Logic of Hegel, pp. 1 to 155.

The selections from Hegel's Logic in Rand: Modern Classical Philosophers, pp. 588 to 613.

(d) *Political Philosophy*—

Green: Principles of Political Obligation.

Bosanquet: Philosophical Theory of the State.

Barker: Political Thought from Spencer to To-day.

Rousseau: The Social Contract.

MacIver: Community.

Laski: Grammar of Politics.

(e) *Philosophy of Religion*—

Introductory—

Galloway, G.: The Philosophy of Religion, pp. 1-53.

Foster, G. B.: The Function of Religion.

I. *Historical*—

Taylor, E. B.: Primitive Culture.

Frazer, J. G.: The Golden Bough (abridged edition).

Galloway, G.: The Philosophy of Religion, pp. 88-152.

Wundt, W.: Elements of Folk Psychology, on Totemism.

Durkheim, E.: Elementary Forms of Religious Life.

Hastings: Encyclopædia of Religion and Ethics—articles: *Animism, Totemism, Fetichism, Magic and Taboo.*

Needham: Science, Religion & Reality.

II. *Psychological*—

Hoffding, H.: Philosophy of Religion, section.

Psychology—

Galloway, G.: Philosophy of Religion, pp 54-87, 153-179, 219-250.

Coe, G. A.: The Psychology of Religion.

Pratt, J. B.: The Religious Consciousness.

King, Irving: The Development of Religion.

III. Logical—

Galloway: Philosophy of Religion, pp. 180-218.

Leuba, J. H.: A Psychological Study of Religion: Appendix.

Pratt, J. B.: The Religious Consciousness.

IV. Epistemological—

Galloway: The Philosophy of Religion, pp. 251-370.

Caird John: Introduction to the Philosophy of Religion, Chapters 6 and 7.

Hastings: E. R. E., Article on Epistemology.

Streeter, B. W.: Reality (Macmillan & Co.).

V. Metaphysical—

Galloway: The Philosophy of Religion, Part III.

Kant: Metaphysics of Morality.

Ward, James: The Realm of Ends.

Taylor: Elements of Metaphysics, pp. 359-407.

Rev. A. G. Hogg: Redemption from the World.

Note.—Students will not be expected to acquire a detailed knowledge of all of the Selected Readings. Special attention will be given to the following works:—

Galloway, G.: The Philosophy of Religion.

Pratt, J. B.: The Religious Consciousness.

Woodburne: Religious Attitude (Macmillan & Co.).

(f) *Experimental Psychology—*

Seashore: Elementary Experimental Psychology.

Myers: Text-book of Experimental Psychology.

Titchener: Experimental Psychology.

Scripture: The New Psychology.

Judd: Psychology, Volumes II and III.

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1, 2 (*a*), 2 (*b*), 3, 4, 6 (*a*), (*b*), (*c*), (*d*), (*e*) and (*f*).

The same as for 1932.

5. Prescribed Modern work.

Sir Henry Jones : A Faith that enquires. Gifford Lectures for 1921 (Macmillan).

Branch III-A.

HISTORY, ECONOMICS AND POLITICS.

ECONOMICS.

Students will be required to show a clear understanding of economic principles by intelligent application of economic theory to Indian facts and problems.

General.—The scope of economics. Relation of Economics to other Sciences. Methods of economic enquiry, deductive and inductive, (*e.g.*, family budgets, village and city surveys, statistics).

Psychological Basis of Economics and Consumption.—Classification of Wants. Satiability, Wants in relation to activities. Elastic and Inelastic Demand. Economic meaning and types of consumption. Conception of 'Utility' and 'Value' Economic motives; the Economic Man', influence of Family System.

The Production of Wealth.—Definition. Production as (*a*) creation of use value, (*b*) creation of Exchange Value. *Classification.* Production for Producer's use (*a*) Individual, (*b*) Social. Production for the Market.

Factors of Production.—Natural forces and materials, soil, sun, rain, minerals, etc. The Principle of Conservation. *Material Capital* (Classification of forms), social and individual capital. *Human energies,* (*a*) physical (*b*) intellectual. Theory of population. Efficiency dependent on (*a*) individual physique, nutrition, knowledge, skill, moral quality. (*b*) social conditions, *e.g.*, social order, co-operation and division of labour, Methods of conserving past acquisitions of skill and knowledge (*e.g.*, hereditary occupations, apprenticeship, industrial education). New acquisitions (*e.g.*,) research and invention).

Characteristics of Modern Production.—Basis (*a*) Individual Property. (*b*) Contract. Character (*a*) Mercantile, (*b*) Capita-

listic. *Forms* (*a*) Individual (peasant and craftsman), (*b*) Patronal (individual employer and joint-stock company), (*c*) Co-operative, (*d*) Collectivist (state and municipal) *Specialization. Concentration* in agriculture, manufacture, transport, commerce. Horizontal and vertical combination. *Competition* and *Monopoly.* Extent to which Indian industry possesses these characteristics.

Stages of Production.—Extractive Industries. Agriculture, Fishing. Forestry, Mining, etc. *Manufacture,* Laws of Diminishing Returns and Increasing Returns. *Transport* and *Commerce,* local, intranational and international. *Money, credit,* and *insurance* as auxiliaries to production.

Mechanism of Exchange.—Origin and functions of money. Metallic Coinage. Monometallism and Bimetallism. Functions of Banks. Fiduciary money and money substitutes. (Treasury notes, bank notes, cheques, bills of exchange). Settlement of accounts, intranational and international. The Rupee. Indian Exchange. Indian Banking organization.

Exchange Value.—Theory of Value. Equilibrium between Demand and Supply. Market value and normal value. Values in international trade. Crises. Overproduction. 'Value of Money' meanings of phrase; Quantity Theory; Cost and marginal Utility Theory. Variations in Value of Money.

Distribution of Wealth.—The Share of Land: *Rent.* Supply and Demand in relation to Land. The Recardian Law of Rent. Economic Rent. Customary Rent. Rack-rent. The sharing of Economic rent in India.

The Share of Labour (*a*) Wages. Supply and Demand in relation to Labour. Theories of Wages (*a*) Minimum subsistence, (*b*) Standard of Life—(*c*) Marginal productivity. Combinations of employers and employees in relation to wages.

(*b*) *Salaries.*—Supply and Demand in relation to acquired knowledge and skill, and exceptional ability.

The Share of Capital: *Interest* —Supply and Demand in relation to Capital. The accumulation of Capital. Conversion of capital from unspecialized forms. Interest on loanable capital. Interest on investments. Capitalization. Promotion.

The Share of Enterprise: *Profits.*—Supply and Demand in relation to business Organization. Profits and the Enterpreneurs. Quasi Rent of net industrial advantage.

The Share of the State: *Taxation*:—The Community as worker and sharer in the product.

Rent, wages, etc., regarded as *cost of production.* How far these enter into price.

Economic Functions of the State—

Duties and Expenses of Government, Local and Imperial, Local and Imperial Taxation. Methods of raising taxes. The Indian Budget. Loans. The Indian Debt.

Theories of Taxation. Taxation according to Benefit, taxation according to ability. Taxation for Revenue only. Incidence of Taxation.

Taxation and International Trade. Free Trade. Retaliation. Imperial Preference, Protection of native industries, Tariffs as part of a policy or national defence or aggrandisement. Commercial treaties.

The State and the Regulation of Industry. Factory Acts and the protection of the worker. Rural indebtedness and its remedies. Migration and emigration. State assistance of Industry.

Public ownership and control. State Socialism.

SPECIAL SUBJECTS.

Any two of the following subjects:—

I. Economic History—

British Indian Administration.

II. Politics—

(i) Political Writings of Burke.

(ii) Federalism (Ancient and Modern)

III. History—

(i) Unification of Germany.

/. Indian History—

(i) Mauryan Empire.

(ii) The Gupta Empire.

(iii) Vijayanagar Empire.

(iv) Moghul India (1605-1707).

V. Economics—

(i) Currency and Banking.

(ii) Public Finance.

Text-books for Study and Reference—

BRITISH INDIAN ADMINISTRATION:—

Kaye: The Administration of the East India Company.

Ilbert: Government of India.

Ramsay Muir: The Making of India.

Mukerji: Indian Constitutional Documents, 2 Vols.

Cowell: History and Constitution of the Courts and Legislative Authorities in India.

Curtis: Dyarchy.

Ilbert: The New Constitution of India.

Chailley: Administrative Problems of the British in India.

Keith: Speeches on Indian Policy.

Archbold: The Indian Constitution.

II. POLITICS—

i. Political Writings of Burke.

Burke, Select Works (with Introduction), by E. J. Payne, Oxford University Press, Vols. 1 and 2.

The Works of Burke. (World's Classics) Oxford University Press.

Vol. 2. Speeches at his arrival at Bristol and at the conclusion of the Poll, 1774.

Speech on presenting to the House of Commons (on Feb. 11, 1780) a plan for the better security of the Independence of Parliament, and the Economical Reformation of the Civil and other establishments.

Vol. 3. Speech at Bristol previous to the elections in that city, 1780.

Speech at Bristol declining the Poll, 1780.

Speech on Fox's East India Bill, Dec. 1, 1783.

Speech on the motion made in the House of Commons, February 7, 1771, relative to the Middlesex election.

Speech on a Bill for shortening the duration of Parliaments.

Speech on a motion made in the House of Commons, May 7th, 1782, for a committee to enquire into the state of the representation of the Commons in Parliament.

Vol 5. An appeal from the new to the old Whigs.

Address to the King.

Address to the British Colonists in North America.

Letters of Edmund Burke: edited by H. J. Laski (World's Classics), Oxford University Press.

The Political Philosophy of Burke, by J. Maccunn.

Lord Morley: Burke.

ii. Federalism, Ancient and Modern

(Books will be prescribed later.)

III. HISTORY—

(i) Unification of Germany

Books for study—

(1) The Cambridge Modern History—

Vol. X : Chap. xi : The German Federation, 1815-40.

Chap. xii : Literature in Germany.

Vol. XI : Chap. iii : Liberalism and Nationality in Germany and Austria.

Chap. vi, vii : Revolution and reaction in Germany (1848-52).

Chap. xv : Austria, Prussia and the Germanic Confederation.

Chap. xvi : Bismarck and German Unity.

Chap. xxi : The Franco-German War.

(2) A. W. Ward: Germany (The Cambridge Historical Series), Vols. I & II, 1815-1871.

(3) Lipson: Europe in the Nineteenth Century.

(4) Marriott and Robertson: The Evolution of Prussia, the Making of an Empire (1915).

(5) Headlam: Bismarck and the Foundation of the German Empire (Heroes of the Nations).

(6) Hearnshaw: Main Currents of European History (1815-1915).

Books for further study and reference—

(1) G. A. Fyffe: The History of Modern Europe.

(2) Seeley: Life and Times of Stein or Germany and Prussia in the Napoleonic Age, 3 vols.

(3) Malleson: The Life of Prince Metternich (1888).

(4) Karl Marx: Revolution and counter-Revolution in Germany, edited by E. Marx Aveling (1896).

(5) Action: The Causes of the Franco-Prussian War—in his 'Historical Essays and Studies (1907).

(6) Bismarck, the Man and the Statesman—An Autobiography.

(7) Buch: Bismarck; Some Secret Pages of his History.

(8) Schwill: The Making of Modern Germany.

(9) Treitschke; History of Modern Germany.

Translation by E. & C. Paul in 6 vols., Vols. I to IV.

(10) H. Von Sybel—Germany under Wilhelm I.

Vols. I to III—Eng. Trans. by L.M. Perin & G. Bradford, New York (1890).

(11) J. Ward: Experience of a Diplomat, being Recollections of Germany founded on Diaries kept during the years 1840 to 1870 (London 1872).

(12) Maurice: The Revolutionary Movement of 1814-49 in Italy, Austria-Hungary and Germany (London, 1887).

(13) G. P. Gooch: History and Historians in the 19th Century (1913) (specially useful on the German Historical School).

IV. INDIAN HISTORY—

i. The Mauryan Empire.
(Books will be prescribed later.)

ii. The Gupta Empire.

Books for Study—

(1) F. E. Pargiter: Dynasties of the Kali Age.

(2) Fleet: Gupta Inscriptions (Corpus Inscriptionum Indicarum III).

(3) Allan: Catalogue of Coins in the British Museum: Gupta Coinage.

(4) Rapson: Catalogue of Coins in the British Museum; Andhra, etc.

(5) Sir John Marshall: Guide to Sanchi.

(6) Vincent Smith: History of Fine Arts in India (relevant chapters only).

(7) S. K. Ayyangar: Vakatakas and their place in Indian History.

(8) Smith's Vakatakas: J. R. A. S. 1914.

(9) Jouveau-Dubreuil: A History of the Deccan.

(10) Legge: Fa Hien.

(11) Bhandarkar: Peep into the Early History of India.

(12) H. C. Ray Chaudri: Political History of Ancient India, Parikshit to the Gupta Empire.

(13) S. K. Ayyangar: Samudragupta and Chandragupta II.

(14) Hun Invasions: J. R. A. S. 1908, Hoernle's article on Yasodharman.

J. B. Br. R. A. S. XIX and XXIV Modi and Pataka.

(15) S. K. Ayyangar: Origin and Early History of the Pallavas

or

R. Gopalan's History of the Pallavas of Kanchi (earlier part).

For further Reading—

(1) A. S. R. 1903—4 Basarh Seals.

(2) Bhitari Seal of Kumaragupta; J. A. S. B. LVII.

(3) Inscriptions of Kumaragupta I. J. A. S. B. V. New Series.

(4) Two Vakataka Grants J. A. S. B. XX New Series. Ep. Ind. XV.

(5) Damodrapur Plates: Ep. Ind. XV.

(6) Samudragupta Ins. Ind. Antiq. 1913.

(7) V. A. Smith: Gupta Chronology, Indian Antiquary. 1902.

(8) Western Satraps: J. R. A. S. 1890 and 1899. Bindulph.

(9) Kay's Indian Mathematics.

iii. Vijayanagar Empire—

R. Sewell: A. Forgotten Empire (Reprint, 1924, 10 sh).

S. Krishnaswami Ayyangar: South India and her Muhammadan Invaders.

Major King: Burhan-i-Ma'asir (Reprinted from the Indian Antiquary—Vol. 28).

S. Krishnaswami Ayyangar: Sources of Vijayanagar History. Abdur Razzak: An account of his voyage to India (Chapter on Vijiyanagar).

R. H. Major: India in the 15th Century (Trans.) (Hakluyt Society). Failing this, Extract in Elliot and Dowson's History of India as told by her own Historians).

S. Krishnaswami Ayyangar: A little known chapter of Vijayanagar History.

H. Krishna Sastri: Three articles on the Dynasties of Vijayanagar—A.S.R.—1907-08, 1908-09 and 1911-12.

Longhurst: Humpi Ruins.

Briggs: Ferishta.

M. Longworth Dames: Book of Duarte Barbosa—chapters relating to Vijayanagar.

Hultzsch: Coins of Vijayanagar (in the Indian Antiquary).

S. Krishnaswami Ayyangar and R. Satyanatha Ayyar: The Nayaks of Madura—Introduction and early chapters up to Chokalinga Nayaka.

For Consultation :—

Epigraphist's reports of Madras and Mysore.

or

Rangachari's Inscriptions of the Madras Presidency.
Danvers—Portuguese India.
Purchas: His Pilgrims, Volume X.

iv. Mughal India, 1605 to 1707—

M. Elphinston: History of India, Ed. E. B. Cowell.

H. G. Keene: History of Hindustan.

Pringle Kennedy: History of the Great Mughals, 2 Vols.

Lane Poole: Aurangzeb (Rulers of India Series).

Jadunath Sircar: History of Aurangzeb (5 Vols. so far published).

Sir William Hunter: History of British India. 2 Vols.

Duff: History of the Mahrattas, Vol. 1 (3 Vols., Cambray & Co., Calcutta, or better Edwardes' edition, Oxford University Press).

Ranade: Rise of the Mahratta Power.

W. Irvine: Life of Aurangzeb (Indian Antiquary reprint).

Memoirs of Jehangir: Trans. by Rogers and Beveridge, 2 Vols. Royal Asiatic Society's Publications.

Sir Henry Elliot: History of India, as told by her own Historians, Vols. VI and VII.

For Consultation only:—

Sir Thomas Roe (Ed. by W. Foster, 2 Vols.).

Manucci: Storia do Mogor (Trans. by Irvine, 4 Vols.).

Bernier: Travels in the Mughal Empire (Vincent Smith's edition, Oxford University Press).

Tavernier: Travels in India (Ball's edition, revised by W. Crookes, 2 Vols. Oxford University Press).

David Macpherson: History of European Commerce with India.

W. Fosters Letters received by the East India Company from its Servants in the East.

J. Talboys Wheeler: Madras in Olden Times.

Jadunath Sircar: The India of Aurangzeb.

J. H. Billimoria: Letters of Aurangzeb.

Gemelli Careri's Travels (Haklyut Society).

Ma'asir-ul-Umara: English translation in the Bibliotheca Indica.

V. Economics—

i. Currency and Banking—

Books recommended—Same as for III-B. (Hons.)

ii. Public Finance—

Books recommended—Same as for III-B. (Hons.)

POLITICS—GENERAL

BRANCH III.

BOOKS RECOMMENDED

Politics:—

Jenks, S.: The State and the Nation.
Warde-Fowler: The City State of the Greeks and Romans.
Sidgwick: Development of European Polity.
Bryce: Modern Democracies.
Dicey: Law of the Constitution.
Keith: Constitution, Laws and Administration of the British Empire.
Ogg: Governments of Europe, 1923 Edition.
E. A. Horne: The Political systems of British India.
Ilbert and Meston: The New Constitution of India.
Pollock: History of the Science of Politics.
Robert H. Murray: History of Political Science.
G. P. Gooch: Political Thought in England from Bacon to Halifax.
H. J. Laski: " " " from Locke to Bentham
W. L. Davidson: " " " from Bentham to Mill.
Ernest Barker: " " " from Herbert Spencer to the Present day.
Maccunn: " " " Six Radical Thinkers.
Joad: Modern Political Theory.
Mill: Representative Government.
Jethro Brown: Underlying Principles of Legislation.
Miss Follett: The New State.

Branch III-B.

ECONOMICS I.

Books recommended.—

Marshall—Principles of Economics.
Taussig—Principles of Economics (3rd Edition).
Devas—Political Economy.
Dalton—Public Finance.
Indian Year Book.

ECONOMICS II.

Books recommended.—

Taussig—International Trade.
Marshall—Industry and Trade.
Cannan—A review of Economic Theory.
Gide and Rist—History of Economic Doctrines.
A selected Economic Classic, (Selections from Ricardo Economic Classics Series edited by W. J. Ashley).

ECONOMICS FOR B.A. (HONS.) DEGREE EXAMINATION.

ECONOMIC HISTORY.

A general survey of the development of industry, trade and agriculture in Great Britain and India chiefly from 1700 A.D. and in France, Germany, U.S.A. from 1850.

Books recommended.—

Knowles—Industrial and Commercial Revolutions in Great Britain during the 19th Century.
Knowles—The Economic Development of British Overseas Empire.
Clapham—The Economic Development of France and Germany.
Bogart—Economic History of the United States.
Dutt—The Economic History of India in the Victorian Age.
Imperial Gazetteer, Vols. III and IV.
Anstey: Economic Development of India.

SPECIAL SUBJECTS.

Any two of the following subjects:—

I. Recent Economic History.
II. Banking and Currency.
III. Labour Problems.
IV. Indian Land Tenures.
V. Rural Economics.
VI. Public Finance.
VII. International Trade.

(Books for study and reference are given below.)

Economics, Special

1. *Recent Economic History* (a general survey of economic developments in Europe, America and India since 1800).

Books recommended—

Knowles: The Industrial and Commercial Revolution (in the Nineteenth Century).
Cunningham: Growth of English Industry and Commerce, Vol. III.
Clapham: Economic Development of France and Germany, 1815-1914.
Ogg: Economic Development of Modern Europe.
Bogart: Economic History of the United States.
Dutt: Economic History of India under British Rule.
Morison: Economic Transition in India.

2. *Banking and Currency* (includes money, credit, foreign exchanges and prices).

Books recommended—

Conant: Money and Banking.
Kemmerer: Modern Currency Reforms.
Fisher: The Purchasing Power of Money.
Lavington: The English Capital Market.
Cassel: The World's Monetary Problems.

Duguid: The Stock Exchange.

Marshall: Money, Credit and Commerce.

Riesser: German Great Banks.

Keynes: Indian Currency and Finance.

Shirras: Indian Finance.

Reports and Evidence of the Indian Currency Committees.

Annual Reports on the Operations of the Currency Department of the Government of India.

Statistics of Joint Stock Banks (Annual).

Babington Smith Committee Report on Indian Currency, 1920.

Flux: Foreign Exchanges.

Hawtray: Currency, and credit.

3. *Labour Problems* (includes trade unionism, socialism, labour legislation, and welfare work.)

Books recommended—

Webb: History of Trade Unionism.

De Montgomery: British and Continental Labour Policy.

Tillyard: The Worker and the State.

Cole: Self-Government in Industry.

O'Brine: Labour Organization.

Survey of Industrial Relations. (Committee on Trade and Industry).

Lindsay, Karl Marx's Capital.

Report of the Indian Factory Commission.

Report of the Indian Industrial Commission.

Publications of the Government of India, Labour Bureau.

The Labour Gazette, Bombay (Monthly).

Broughton: Labour in Indian Industries.

Census of India, 1921, India and Madras, Chapters on Industries and occupations.

Shirras: Report on an enquiry into the wages and hours of labour in the Cotton Mill Industry.

ECONOMICS FOR B.A. (HONS.) DEGREE EXAMINATION.

4. *Indian Land Tenures* (includes the development and main features of the principal systems of land tenure in India).

Books recommended—

Baden-Powell: A Short Account of the Land Revenue and its Administration.

Land Revenue Resolution of the Government of India (1902) and connected papers.

Arbuthnot: Selections from the Minutes of Sir T. Munro.

Seton Kerr: Marquess Cornwallis.

Bradshaw: Sir Thomas Munro.

Temple: James Thomason.

Srinivasaraghava Ayyangar: Memorandum on Forty Years' Progress of the Madras Presidency.

5. *Rural Economics* (includes the organization and financing of agriculture with special reference to the co-operative movement in relation to agriculture).

Books recommended—

Carver: Agicultural Economics.

Nicholson: Report on the Introduction of Land and Agricultural Banks, Vol. I.

Leake: Agriculture in the United Provinces.

Slater: Some South Indian Villages.

Srinivasaraghava Ayyangar: Memorandum on Forty Years' Progress in the Madras Presidency.

Jack: Economic Life of a Bengal District.

Darling: The Punjab Peasant in Prosperity and Debt.

Baden—Powell: A short Account of Land Revenue and its Administration.

Report of the Royal Commission on Indian Agriculture.

Reports of the Indian Famine Commissions of 1880 and 1901.

6. *Public Finance* (includes the economic functions of the State, the raising and spending of taxes and public loans, and the regulation of tariffs).

Books recommended—

Bastable: Public Finance.

Adams: Finance.

Stamp: The Principles of Taxation.

Seligman: Essays in Taxation.

Seligman: Shifting and Incidence of Taxation.

Hobson: Taxation in the New State.

Redlich and Hurst: Local Government in England (Chapter dealing with finance).

Shah: Indian Finance during the Past Sixty Years.

Budget Statements of the Government of India since 1910.

Findlay Shirras: Science of Public Finance.

Indian Taxation Committee Report, 1926.

7. *International Trade* (includes the theory of international trade, tariff policies and methods, and the distribution and movement of the world's trade in staple commodities).

Books recommended—

Taussig: International Trade.

Bastable: The Theory of International Trade.

Percy Ashley: Modern Tariff History.

Taussig: Some Aspects of the Tariff Question.

Pigou: Protection and Preferential Import Duties.

Cunningham: The Rise and Decline of the Free Trade Movement.

Gregory: Tariffs—A Study in Method.

Pitman's Series: The World and its Commerce.

Report of the Indian Fiscal Commission, 1922.

Annual Trade Statistics of the Government of India.

Ainscough: Reports on the Condition of British Trade in India.

Cotton: Handbook of Commercial Information for India.

PRELIMINARY, B.Sc. (OLD & NEW) AND B.Sc. (HONS.)—PART I DEGREE EXAMINATIONS, 1931, 1932 & 1933.

B. A. (Hons.) Preliminary, B. Sc. (Old), B. Sc. (New) and B. Sc. (Hons.) Degree Part I Examinations.

1931

19th Century Prose—

Newman: Literary Selections (Longmans, Green & Co.).

Arnold: Selections, Edited by H. W. Rawlinson (Macmillan & Co.).

Non-detailed Study—

Jane Austen: *Emma.*

Borrow: *Lavengro.*

Hardy: *Far from the Madding Crowd.*

1932.

19th Century Prose—

Newman: Literary Selections (Longmans).

Pater: Selections—Edited by H. W. Rawlinson. (Macmillan & Co.).

Non-detailed Study—

Scott: Bride of Lammermoor

George Eliot: Romola.

R. A. Gregory: Discovery.

1933

19th Century Prose.—

Carlyle's Essays on Burns and Johnson (Blackie).

Pater: Selections: edited by Rawlinson (Macmillan & Co.).

or

Ruskin: Unto this Last.

Non-detailed Study.—

Pride and Prejudice.

Great Expectations.

The English Voyages of the 16th Century, Raleigh (Agents—Macmillan & Co., Ltd., Mount Road, Madras).

B. A. (HONOURS) DEGREE EXAMINATION

BRANCH V.

ENGLISH LANGUAGE AND LITERATURE.

1932.

Division (a)—

Old English: Anglo-Saxon Reader, by A. J. Wyatt.

For Detailed Study: Selections 1, 2, 3, 7, 11, 14, 20, 24, 26, 28, 33 and 34.

Middle English. Emerson's Middle English Reader, the following selections:—

Part 1-A—1, 2.

Part 1-B—1, 6, 7.

Part 2-A—1, 3, 5, 6.

Part 2-B—2, 4, 5, 6, 8.

Chaucer: The Prologue, the Knight's Tale, The Nun's Priest's Tale.

The Pearl (edited by Osgood, Belles Lettres Series).

Division (b):—

**Shakespeare*—

A Midsummer Night's Dream, Henry V, Twelfth Night, Othello, Cymbeline.

Poetry and Prose of the fifteenth to the nineteenth century.—

Modern Literature I.

Before 1660.

Surrey, Wiat, Selections in Skeat's Specimens of English Literature from 1394 to 1579.

Spenser: Fairie Queen Book I,* Prothalamion, Epithalamion.

Ballads: in Ward's English Poets, Volume I. Elizabethan Lyrics and Sonnets in Palgrave's Golden Treasury—Book I.

Prose—

Mandeville, Wycliff, Malory, Berners, More and Hooker in Craik's Selections.

Sidney: Apologie for Poetry.*

Bacon: First Twelve Essays, New Atlantis.

Browne: Religio Medici, Book I.

Milton: Areopagitica.*

Drama—

Marlowe: Edward II,* Dr. Faustus.

Kyd: Spanish Tragedy.

Jonson: Everyman in his Humour, Bartholmew Fair.

Beaumont & Fletcher: Philaster, The Knight of the Burning Pestle.

Massinger: New Way to pay old debts.

Webster: White Devil, The Duchess of Malfi.*

Modern Literature II.

Between 1660 *and* 1780.

Poetry—

Milton: Paradise Lost, Books* 1 and 2, and Samson Agonistes.

Dryden: Absalom & Achitophel,* MacFlecknoe.

Palgrave: Golden Treasury of Songs, Book II.

Pope: Epistle to Arbuthnot,* Essay on Criticism, Rape of the Lock.

Collins and Gray: Selections in Ward's English Poets.

Goldsmith: Deserted Village.

Thomson: The Seasons, Winter.

Burns: Songs in Palgrave's Golden Treasury.

Prose—

Bunyan: Pilgrim's Progress, Part I.

Dryden: Preface to the Fables.*

Defoe: Moll Flanders.

Swift: Tale of a Tub, Battle of the books.*

Addison: Selections, Ed. Lobban.

Richardson: Clarissa (abridged edition, Routledge).

Fielding: Tom Jones.

Johnson: Preface to Shakespeare,* Milton, Dryden, Pope.*

Selections from Great Letter Writers (Blackie & Sons), (Nos. 23 to 100).

Burke's Speeches, edited by Selby.

Gibbon: The Muhammadan World (Longmans).

Dryden: All for Love (World's Classics).

Congreve: Way of the World.*

Goldsmith: She stoops to conquer.

Sheridan: The Rivals.

Modern Literature III.

After 1780.

Poetry—

Wordsworth: Selections, edited by Nichol Smith (Clarenden Press).

Coleridge: Selections in Ward's English Poets.

Byron: Vision of Judgment.

Shelley, Keats*: Selections in Ward's English Poets.

Rossetti: The Blessed Damozel, Rose Mary, The White ship, The King's Tragedy.

Browning: Rabbi Ben Ezra,* Abt Volger,* Fra Lippo Lippi.* Pippa Passes.

Tennyson: In Memoriam.

Arnold: The Forsaken Merman, Sohrab, The Scholar Gipsy,* Thyrsis.*

Morris: Defence of Guinevere and other poems.

Prose—

Scott: Bride of Lammermoor.

Jane Austen: Pride and Prejudice, Emma.

Lamb: Essays of Elia, I Series.*

Newman: Literary Selections (Longmans).

Thackeray: Esmond.

Arnold: Selections, Ed. Rawlinson (Macmillan).

Pater: Selections, Ed. Rawlinson* (Macmillan).

Stevenson: Selections, Ed. Dunn (Longmans).

Meredith: Richard Feverel, The Egoist.

Hardy: Far from the Madding Crowd, Tess of the Durbevilles.

Drama—

Arnold: Merope.

Swinburne: Atalanta in Calydon.*

Shaw: St. Joan.

Drinkwater: Abraham Lincoln.

Division (c)—Special Period—

Elizabethan Literature (1558 *to* 1637).

1. *The Drama.*—Kyd: *The Spanish Tragedy.** Greene: *Friar Bacon and Friar Bungay.* Marlowe: *Dr. Faustus.** Ben Jonson: *The Alchemist, Volpone.* Beaumont and Fletcher: *The Faithful Shepherdess, The Knight of the Burning Pestle.* Webster: *The Duchess of Malfi.** Dekker: *A Shoemaker's Holiday.* Heywood: *A Woman Killed with Kindness.* Middleton: *The Witch.* Massinger: *A New Way to pay Old Debts.** Shirley: *The Traitor.*

II. *Non-Dramatic Poetry.*—Spenser: *The Faerie Queene,* Books I* and II. *An Anthology of Poetry of the Age of Shakespeare,* edited by W. T. Young (The Cambridge Press). Shakespeare: Sonnets.* Marlowe: Hero and *Leander,* Sestiads I and II.

III. *Prose.*—Lyly: *Euphues, The Anatomie of Wit.* Ascham: *The Schoolmaster,* Book II.* Hakluyt: *Voyages of Elizabethan Seamen,* edited by E. J. Payne, First Series. Raleigh: *The Last Fight of the Revenge.* Hooker: *Ecclesiastical Polity* Book I. Bacon: *The New Atlantis. Henry* VII.* Dekker: *The Gull's Horn Book.*

2. *The Age of Milton and Dryden.*

(Set books will be announced later, if required.)

3. *The Age of Pope and Johnson.*

Prose—

Defoe: Captain Singleton.

Addison: The Coverley Papers*—Edited by O. Myers (George Harrap).

Swift: Selections* in the Scott Library (Omitting the Battle of the Books).

Richardson: Pamela.

Fielding: Tom Jones.

Sterne: A Sentimental Journey.

Smollett: Humphrey Clinker.

Gibbon: The Crusades.*

Burke: Speeches*—Edited by F. G. Selby (Macmillan).

A Shorter Boswell: Edited by J. Bailey (Thomas Nelson & Sons).

Johnson: Life of Milton.

Walpole: Letters (Bohn's Classics).
The Castle of Otranto.

Goldsmith: She Stoops to Conquer.*

Sheridan: The School for Scandal.

Miss Burney: Evelina.

Poetry—

Pope: The Essay on Criticism. The Rape of the Lock.*
The Epistle to Augustus.* The Epistle to Dr. Arbuthnot.

Gay: Trivia. The Beggar's Opera.

Churchill, Smart, Thompson*: Selections in Ward's English poets.

The poetical Works of Collins* and Gray*—Edited by A. L. Pool (Oxford).

Johnson: The Vanity of Human Wishes, London.

Cowper: The Task.

Goldsmith: Traveller*, The Deserted Village, Retaliation.

4. *Wordsworth and his Contemporaries.*

Poetry—

Wordsworth: *The Prelude.** Coleridge: *The Ancient Mariner, Christabel, Dejection.** Scott: *Marmion, Lay of the Last minstrel.* Campbell: *Ye Mariners of England, Battle of the Baltic.* Shelley: *Prometheus Unbound,* Adonais.** Keats: *Endymion,* -Eve of St. Agnes, Isabella.* Byron: *Childe Harold,* Cantos 1 to 4; *Don Juan,* Cantos 1 to 4. Southey, Landor, Moore, *Selections in Ward's English Poets.*

The Drama—Shelley: *The Cenci. Byron*: *Manfred.*

Prose.—Coleridge: *Biographia Literaria.* Wordsworth: *Preface to the Lyrical Ballads.** Hazlitt: *The English Poets, Essays on the Comic Writers.* Lamb: *Essays of Elia and Critical Essays*, edited by Ainger, Landor: *Imaginary Conversations** (Blackie & Son) Indian edition. De Quincey: *Confessions of an Opium Eater.* Shelley: Defence of *Poetry.** Southey: *Life of Nelson.* Cobbet and Leigh Hunt: *Selections in Craik's English Prose*, Vol. 5.

The Novel.—Jane Austen: *Pride and Prejudice, Emma,* Lytton: *Last Days of Pompeii.* Scott: *Kenilworth, Rob Roy, Quentin Durward.* Peacock: *Melincourt.*

5. *Tennyson and his Contemporaries.*

(Set books will be announced later, if required.)

6. *Indo-Germanic Philology with special reference to Sanskrit.*

A Sanskrit Reader, by C. R. Lanman (Ginn & Co.).

A Sanskrit Grammar for Beginners. New edition, by A. A. Macdonell (Longmans).

A Sanskrit Primer, by G. D. Perry (Ginn & Co.).

The following books indicate the character and scope of the course:—

A. Thumb: Handbuch der Sanskrit, Vol I.

C. G. Uhlenbeck: A: Manual of Sanskrit Phonetics.

Loewe: Germanic Philology, English Translation by Jones.

L. Armitage: Introduction to Old High German Grammar.

Giles: A Short Manual of Classical Philology for Classical Students.

L. Bloomfield: An Introduction to the study of Language —English Edition (G. Bell & Sons, London).

Note:—Candidates are required to show a detailed knowledge of books marked with asterisk.

SANSKRIT LANGUAGE AND LITERATURE

Branch vi—B. A. Honours.

GENERAL PART

1932 and 1933.

Siddhānta-kaumudî : (*a*) Pûrvārdha, from Strîpratyayaprakarana to the end of Apatyādhikāra in the Taddhitaprakriyā

(*b*) Uttarārdha, the whole omitting Uṇādiprakarana.

Vidyānātha : Prātāparudra-yaśō-bhûṣaṇa.

Ṛig Vêda : Macdonell's Vêdic Reader, hymns I to X together with Sāyaṇa's Upōdghāta to his Ṛg-Bhāṣya and the corresponding passages (I to X) in the Sāyana's Commentary on the Ṛg. Vêda. (Oxford University Press).

Yāska : Nirukta, Naighaṇṭuka-kāṇda, Chapter II.

Mudrārākṣasa : by Viśākhadatta.

Śrî Harṣa : Naiṣadhîyacarita Cantos IV, V and VI.

Bāṇa : Harṣacarita, Ucchvāsas I to III.

In connexion with Branch vi *of the B.A. (Honours) Degree Examination, the attention of students is invited to the following books, though it must be distinctly understood that they are not prescribed as text-books.*

1. Science of Language, History of the Sanskrit Language and History of Sanskrit Literature.

Books recommended for study—

Jesperson: Language, its origin, theory and development.

Giles: Short Manual of Comparative Philology for classical students (Macmillan).

Tucker: Introduction to the Natural History of Language (Blackie).

Sweet: The History of Language (Temple Primers).

Bloomfield: Introduction to the Study of Language (G. Bell & Sons).

Macdonell: Vedic Grammar for Students (Oxford University Press).

Whitney: Sanskrit Grammar (Kegan Paul, Trench, Trubner & Co.).

Uhlenbeck: Manual of Sanskrit Phonetics (Luzac & Co.).

Kaegi: The Rig-veda: the oldest Literature of the Indians (Ginn & Co., Boston).

Macdonell: History of Sanskrit Literature (William Heinemann).

Macdonell: India's past.

Max Muller: History of Ancient Sanskrit Literature (Reprint, Panini Office, Allahabad.)

A. B. Keith: 'Classical Sanskrit Literature' and 'Sanskrit Drama, its origin, theory and development.'

Books recommended for consultation—

Brugmann: Comparative Grammar of the Indo-Germanic Languages, translated by Wright, Conway and Rouse.

Bopp: Comparative Grammar of the Sanskrit, Zend, Greek, Latin, Lithuanian, Gothic, German and Slavonic languages (translated by Eastwick.)

Schleicher: Compendium, translated by Bendall

Whitney: Life and Growth of Language.

„ : Language and its Study.

„ : Oriental and Linguistic Studies.

Max Muller: Lectures on the Science of Language

„ : Biography of Words.

Delbruck: Introduction to the Study of Language.

Carl Abel: Linguistic Essays.

Lefevre: Race and Language.

Gray: Principles of Indo-Iranian Phonology.

Thumb: Handbuch des Sanskrit.

Wackernagel: Altindische Grammatic.

Macdonell: Vēdic Grammar.

Beams: Comparative Grammar of the modern Aryan languages of India.

Hoernle: Comparative Grammar of the Gaudian languages.

Arnold: Vēdic Metre.

Bloomfield: The Atharva-vēda.

Ṛg., Yajus and Atharva-prātisākhyas.

Goldstucker: Pāṇine, his place in Sanskrit Literature.

Weber: History of Indian Literature translated by Mann and Zachariah.

Muir: Original Sanskrit Texts.

Stein: Kalhaṇa's Chronicle of Kāshmir.

Ragozin: Vēdic India.

Rhys Davids: Buddhist India.

V. A. Smith: Early History of India.

Rapson: Ancient India.

R. C. Dutt: History of Civilization in Ancient India.

C. V. Vaidya: Epic India.

" Riddle of the Rāmāyaṇa

Bhandarkar: Early History of the Dekkan.

Schrader: Prehistoric Antiquities of the Aryan Peoples.

Langlois and Seignobos: Introduction to the Study of History (translated by Berry).

A. B. Keith: Religion and Philosophy of the Vedas and Upanisads—Harward Oriental Series.

Winternitz—History of Sanskrit Literature.

Special Part.

1932 and 1933

Vyākaraṇa and Alamkāra :—

Bhaṭṭoji Diksita: Prauḍhamanōramā-Samjñā, Paribhāṣā, Sandhi Strīpratyaya and Kāraka-prakaraṇas (Benares Edition).

Patañjali : Mahābhāṣya, I, i, āhnikas i to iii (Nirnaya Sagara Press, Bombay).

Bhartṛhari : Vākyapadīya, Kánda I (Benares Edition).

Ânandvardhana : Dhvanyālōka (Nirnaya Sagara Press, Bombay).

Rasagangādhara by Jagannātha Paṇdita : First Ânana only (Nirnaya Sagara Press, Bombay).

Books recommended for study:—

Goldstucker: Pānini, his place in Sanskrit Literature.

Belvalkar: Systems of Sanskrit Grammar.

Aristotle: Poetics.

Bain: English Composition and Rhetoric.

Vaughan: Literary Criticism.

Winchester: Principles of Literary Criticism.

Gayley and Scott: Methods and Materials of Criticism.

S. K. De: History of Sanskrit Poetics.

Books recommended for consultation :—

Mammaṭa : Kāvyaprākās'a

Dhananjaya : Das'arūpaka

Courthope: Life in Poetry and Law in taste

Saintsbury: History of Literary Criticism.

N.B.—Students are informed that all the Oriental books in the above lists can be procured through the Oriental Books Supplying Agency, 15, Shukrawarpet, Poona, or through the Proprietor, The Punjab Sanskrit Book Depot, Said Mitha Bazaar, Lahore.

ARABIC LANGUAGE AND LITERATURE

1932.

Branch vii.

Note.—For the M.A. Degree Examination the same text-books as for the B.A. (Honours) Degree Examination with the omission of Comparative Philology and Comparative Grammar are prescribed.

General Part—

1. The Commentary of al Baidawi, Suras 1 to 3.
2. Saba-1-Mu'allaqat.
3. Hamasa, first half.
4. Yatimatu'd-Dahr, Vols. I and II.
5. Diwan of Mutanabi, Vol. I, (Ukbari's Commentary).
6. Makhamat of Hariri and Badiuzzamanal Hamadhani.
7. Sahihu'l-Bukhari. 1st quarter.

Grammar, Prosody and Poetics—

8. Asrarul-Balaghat } by Abdul Kahir Jurjani.
9. Dalailu'l-Ijaz }
10. Wright's Arabic Grammar, Vols. I and II.
11. Wright's Comparative Grammar of the Semitic Languages.
12. Nicholson's Literary History of the Arabs.

Special Part—

1. Life of Muhammad (Ibn-i-Hisham).
2. Tarikhu'l-Khulafa (Suyuti).
3. Fathu'l-Qissi-fi Fathu'l Kudsi (Imadu'd din-al-Katib).
4. Prolegomena of Ibn Khaldun.

The attention of students is invited to the following books, though it must be distinctly understood that they are not prescribed as text-books.

I. *Books recommended for study with reference to the General Part—*

1. The Kamil of Mubarrad (Ed. by Wright).
2. Majma'a-ul-Bahrayn.
3. Diwans of Farazdaq, Hassan ibn-i-Thabit, Jarir, Abu Tammam, Abu Nuwas, Adu'l-Ala-al Ma'arri.
4. History of Islamic Civilisation (Zaidan).
5. Al-Masalik Wa'l-Mamalik.
6. Milal wa'n-Nihal (Shahristani).
7. Al-Aghani. Vols. I to IV.
8. Oriental and Linguistic Studies (Whitney).
9. History of Arabic Literature (Huart).
10. Shu'araun-Nasraniya.
11. Translation of Arabian Poetry (C. F. Lyall).
12. Lectures on the Religion of the Semites (Robertson Smith).
13. Kinship and Marriage in Early Arabia.
14. Kitabu'l-Amali, Vols. I and II (Abu Ali-al-Qali).

II. *Books recommended for study with reference to the Special Part—*

1. The Annals of Tabari.
2. Al-Fakhri.
3. Ibn-i-Khallikan's Biographical Dictionary.
4. Yaqut's Dictionary of Learned Men (Ed. by Margoliouth.)
5. Ar-Raudata.
6. Ibn Khaldun.
7. History of the Seljuks.
8. Mukhtasaru'd-Duwal (Abu'l-Faraj).
9. The Spirit of Islam (Amir Ali).
10. History of the Saracens (Amir Ali).
11. Rise, Decline and Fall of the Caliphate (Muir).
12. History of the Muhammadan Dynasties of Spain (Nafhu't Tib Maqqari).
13. The Moors in Spain by Stanley Lane-Poole (Story of the Nations Series).
14. History of the Mongols (Ed. by Blochet).
15. Life of Timur (Ibn-i-Arabshah).
16. Tarikh-i-Ferishta.
17. Al-Biruni's India.

B. A. (Hons.) Degree Examination, 1933.

ENGLISH LANGUAGE AND LITERATURE.

The same as for 1932.

SANSKRIT LANGUAGE AND LITERATURE.

BRANCH VI—B.A. (HONS.).

The same as for 1932.

ARABIC LANGUAGE AND LITERATURE.

1933

The same as for 1932.

B.A. (Hons.) Degree Examination
1934

ENGLISH LANGUAGE AND LITERATURE.

The same text-books as those prescribed for 1933, except in the case of the Plays of Shakespeare, which shall be "Love's Labour Lost, Henry IV, Part I, As You Like It, Lear and The Tempest."

SANSKRIT LANGUAGES AND LITERATURE.

Branch VI—B.A. (Hons.).

1934 and 1935.

GENERAL PART

Same as for 1933, with the change that the Mṛcchakaṭika replaces the Mudrārākṣasa.

Books recommended for study and consultation—The same as for the general part for 1933.

SPECIAL PART.

Vedānta and Mīmāmsā.

1. Dharmarājādhvarin : Advaita-paribhāṣā (Venkateswar Steam Press, Bombay).
2. Rāmānuja : Vedārthasamgraha (Lazarus & Co., Benares).
3. Madhvācārya ; Daśaprakaraṇas, omitting Karmanirṇaya and Viṣṇutattva-nirṇaya (Madhva Vilas Book Depot, Kumbakonam).
4. Sankarācārya : Brahma-sûtra-bhāṣya, Catussūtrī only (Nirnaya Sagara Press, Bombay).
5. Apōdēva ; Mimāmsā-nyāya-prakās'a (Chowkhāmba Book-depot, Benares).

Books recommended for study—

F. Max Muller : The Six Systems of Indian Philosophy (Macmillan & Co.).

P. Deussen : The Philosophy of the Upaniṣads, translated by Rev. A. F. Geden (T. Clark & Co.).

P. Deussen : Outline of the Vedanta System, translated by C. Johnston (Luzac & Co.).

K. L. Sircar : The Mīmāmsā Rules of Interpretation (Tagore Law Lectures, Thacker, Spink & Co., Calcutta).

A. B. Keith : Karma-Mīmāmsā.

Rāmakṛṣṇadīkṣita's Commentary on the Advaita-paribhāṣā (Venkateswar Steam Press, Bombay).

Books recommended for consultation—

Śrī Harṣa : Khaṇḍana-Khaṇḍa Khādya.

Mādhavācārya : Sarvadarśana-Saṃgraha

Śābara-bhāṣya with Kumārila's Vārtika.

Vācaspati Miśra : Bhāmatī.

Advaitānandasarasvatī : Brahmavidyābharaṇa.

Appayyadīkṣita : Nyāya-rakṣāmaṇi.

Mādhavācārya : Jaiminīya-Nyāya-Mālāvistara.

The Ṭīkās on Mādhvācārya's Daśaprakaraṇas.

Pārthasārathi Miśra : Śāstra-dīpikā.

Vedānta Deśika : Nyāya-pariśuddhi.

G. Thibaut : The Vedānta-Sūtras, with commentary by Śaṅkarācārya : Introduction.

W. James : Pragmatism.

F. H. Bradley : Appearance and Reality.

J. Royce : The World and the Individual, First Series, Lecture IV.

R. Flint : Theism and Antitheistic Theories.

H. Lotze : Microcosmus, Book IX, Chap. IV, translated by G. Hamilton and G. G. C. Jones.

L. T. Hebhouse : Theory of Knowledge.

A. K. Roger : A brief Introduction to Modern Philosophy.

ARABIC LANGUAGE AND LITERATURE.

1934

The same as for 1933.

APPENDIX V.

B. Sc. DEGREE EXAMINATION.

Syllabuses.*

(i) *Mathematics—Main*

Same as for B.A. (Pass) Main (i.e., i-b, omitting optional Subject) with the addition of—

Differential equations, ordinary and partial.

The standard to be as in Murray's Differential Equations; when those parts are omitted which concern only the student of Pure Mathematics.

Mathematics—Subsidiary.

Algebra and Trigonometry. Simple practical applications of the binomial, exponential, and logarithmic series, compound interest law.

Complex numbers, their geometrical representation; de Moivre's theorem and its immediate applications. Use of the expansion of the sine and of the cosine in power series.

Hyperbolic functions.

Analytical Geometry as for B.A. excluding the general equation of the second degree and polar equations.

Calculus—Same as for B.A. with the following addition.

Elementary differential equations with special reference to application to Physics and Chemistry. Standard as in Lamb's Infinitesimal Calculus.

In each of these two subjects (Algebra and Trigonometry, and Calculus), candidates will be expected to show familiarity with the graphs of the principal functions occurring in Physics and Chemistry.

(ii) *Physics—Main.*

The course includes a more extended study of the matter included in the Intermediate course and in addition the following:—

Dynamics.—Resolution and composition of displacements, velocities, and accelerations. Curves of speed and velocity diagrams. Motion of a particle in one plane under constant accelerations. Simple harmonic motion; composition of simple harmonic motions. Angular velocity and angular acceleration; moment of velocity.

Absolute units of force. Resolution and composition of forces. Angular momentum: moments of inertia in Simple cases; the pendulum; determination of g. Work, energy, conservation of energy; energy diagrams. Impact; the ballistic pendulum,

Simple cases of the dynamics of strings. Dimensions of dynamical units. Conditions of equilibrium of a body acted on by forces in one plane. Moments, couples. Centre of mass. The theory of simple machines. Laws of friction. Graphical methods with simple applications. Smooth hinges. Virtual work.

Properties of matter.—Gravity, Gravitation, Elasticity, Hooke's Law. Compressibility of gases (at high and low pressure) and liquids. Compressibility and rigidity of solids; the elastic limits. Strains due to simple longitudinal pull; Young's modulus and its expression in terms of k and n. Bending in one plane of bars of simple cross sectional area; flexural rigidity: application to girders. Simple twisting of wires of circular cross sectional area by couple in plane at right angles to length; torsional rigidity; applications to torsion balance, and shafts.

Diffusion of liquids and gases; analogy with conduction of heat. Osmosis, viscocity. Pressure of a gas and its explanation on the kinetic theory; Avogadro's hypothesis: Van der Waal's equation.

Hydrostatics.—Thrust of fluid on plane and curved surfaces. Centre of pressure in simple cases. Floating bodies and conditions of stability. Properties of gases; determination of heights by barometer. Pumps, pressure gauges, and hydrostatic machines. Capillary phenomena and their explanation by surface tension; general theory of surface tension.

Heat.—The methods of calorimetry and thermometry. Vapour pressures, critical temperature and pressure. Conduction and diffusion of heat and the determination of constants. Kinetic Theory of gases: simple applications. Radiation and absorption; laws of cooling. Theory of exchanges; methods of measuring radiation. Laws of thermo-dynamics, simple applications.

Light.—Velocity of light. Illumination; photometry. Achromatism in lens systems; direct vision spectroscope.

The wave theory; simple interference phenomena. Huygens' principle. Explanation of straight line propagation, reflexion and refraction of light. Action of mirrors, lenses, etc., reviewed from this standpoint. Simple diffraction phenomena. Gratings and wave length determination. Spectrum analysis; Study of spectra; Doppler's prineiple. Double refraction and polarization of light; rotatory polarization; simple applications.

Magnetism.—Forces on a magnet in a magnetic field. Determination of the axis and moment of a magnet. Magnetic potential, level surfaces. Interaction of two short magnets, determination of field strength. Magnetic shell; its potential energy in magnetic field. Total normal induction, Gauss' theorem; number of lines of force. Magnetic induction in iron, etc. Theory of magnetism.

The magnetic field of the earth; the magnetic elements and their variations; the compass and its corrections.

Electricity.—Electric capacity; specific inductive capacity. Distribution of electricity on surface of conductors; images. Value

of electric force in simple cases of distribution. The mechanical force on charged conductors; energy of electrified systems. The dielectric medium; dielectric displacement currents.

Wheatstone's bridge; specific resistance; resistance thermometers. Conductivity of electrolytes; ionization; migration phenomena; accumulators, Standard cells; the potentiometer system of measurement. Thermo-electricity; application of thermo-dynamics; thermo-electric diagrams. Electro-magnetic induction: Co-efficients of induction: induction coils. Energy of circuit carrying current when placed in a magnetic field; mechanical force on conductors carrying current; moving coil instruments. Lenz's law; illustration from dynamos and motors, etc. Determination of current resistance, E. M. F. in absolute measure. The discharge of a condenser: electric waves. The Triode.

The elementary theory of the continuous current dynamo and motor and of the alternate current dynamo. General principles of the application of electricity to lighting, power transmission, telegraphy, etc.

Sound.—The transmission of energy through material media by wave motion; speed of propagation of waves of permanent type. Nature of musical sound; pitch scales. Reflexion and refraction of sound; influence of wave length. The vibration of strings, bars, plates, and gas columns; resonance. Interference and diffraction phenomena. Analysis of sound. Measurement of wave length, velocity and pitch.

A practical examination will be held to test the candidate's acquaintance with the phenomena and his ability to show them, as well as his ability to make physical measurements. At the practical examination candidates must submit to the Examiner or Examiners their laboratory note-books duly certified by their professors or lecturers as a *bona fide* record of work done by the candidates.

Books for Study—

The same as for B.A. (New)—Main—1933 with the following addition:—

Hutchinson: Magnetism and Electricity.

Physics—Subsidiary.

Properties of Matter.

Compressibility of gases (at high and low pressure). Diffusion of liquids. Osmosis, viscosity, pressure of a gas, and its explanation on the kinetic theory; Avogadro's hypothesis, Vander Waal's equation.

Hydrostatics.

The same as for candidates taking Physics Main (B.A. Pass), but *excluding* "Thrust on planes surfaces. Centre of pressure in simple cases. Floating bodies and conditions of stability."

Heat.

The same as for candidates taking Physics Main **(B.A. Pass).**

Light.

The same as for candidates taking Physics Main **(B.A. Pass),** but *omitting* "geometrical optics".

Electricity.

The same as for candidates taking Physics Main (B.A. Pass), but *excluding* Statical Electricity.

Magnetism.

Determination of the axis and moment of a magnet. Determination of field strength. Magnetic induction in iron, etc. Theory of magnetism.

The magnetic field of the earth; the magnetic elements and their determination.

Sound.

Nature of musical sound. The vibration of strings and gas columns. Resonance. Interference of sound. Measurement of wave length, velocity and pitch.

Books for Study—

The same as for B.A. (New)—Subsidiary—1933.

Mechanical Engineering and Electrical Engineering as Subsidiary to be taken with Physics as Main.

Vide Syllabus under B.A. Degree Course.

(iii) *Chemistry—Main.*

(a) *Chemistry—General and Historical.—*

The atomic theory, Valency. Methods of determining equivalent, atomic and molecular weights. Atomic Numbers. Isotopes. Properties of gases. Transition phenomena from the gaseous to the liquid state. Properties of solutions, osmotic pressure; vapour pressure and freezing and boiling points. Velocity of reactions and the law of Mass Action; Phase rule. Theories of the Colloidal state, theory of electrolytic dissociation. Transport numbers, conductivity and electro-motive force. Thermo-Chemistry. Relation of physical properties to chemical constitution.

(b) *Inorganic Chemistry:—*

The descriptive portion of Inorganic Chemistry will include the elements and their compounds studied from the standpoint of the Periodic classification omitting the detailed study of rare metals and their compounds.

(c) *Organic Chemistry—*

Historical development of the Science—Methods of Purification and the criteria of purity of organic compounds—Analysis of organic compounds. Calculation of empirical and molecular formulæ. Constitutional formulae. Isomerism and Polymerism.

Paraffins; halogen substitution products. Alcohols. Alkylesters of inorganic acids; Ethers. Aldehydes and ketones, and their derivatives. Fatty acids; their esters, chlorides, amides and anhydrides. Olefines and acetylenes. Unsaturated alcohols. Aldehydes, ketones and acids. Amines. Urea and Urethanes. Cyanogen compounds. Organo-metallic derivatives. Glycol and Glycerol and their derivatives. Dibasic acids of the Oxalic series. Hydroxy monobasic and polybasic acids. Stereoisomerism of carbon compounds. Diketones and ketonic acids and esters. Amino acids and polypeptides. Sugars, starches and celluloses Polymethylenes.

Benzene and its homologues. Chloro-nitro-amino-and sulphonic derivatives of aromatic hydro-carbons. Phenols, Azoxy-Azo and Hydarxo compounds. Diazo-bodies and their reactions. Benzyl alcohol. Benzaldehyde. Benzoic acid and their derivatives. Acetophenone and Benzophenon and their derivatives. Polysubstitution products, e.g., di—and triphenols, etc., and poly-carboylic acids, hydroxy aldehydes, Hydroxy ketones. Hydroxy acids.

Laws of Orientation of aromatic substitution products. Dephenyl methane, phenyl ethylene and Diphenyl ethylene and their derivatives. Triphenyl methane, phthaleins and rosanilines. Naphthalene. Anthracene and Phenanthrene and their chief derivatives.

(d) *Practical Chemistry.—*

(1) Qualitative analysis, including analysis of mixtures of mineral substances.

(2) Quantitative analysis, including (a) the estimation of alkalis, alkaline carbonates, and acids by neutralization, (b) determinations involving the use of the permanganate, dichromate, iodine and thiosulphate processes, (c) the estimation of chlorides and cyanides by titration with silver nitrate, and also with thiocyanate, (d) gravimetric determinations of iron, calcium, copper, silver, lead, sulphuric acid, hydrochloric acid, phosphoric acid.

Candidates at Examinations will be required to be able to standardize the solutions for volumetric analysis.

(3) The determination of molecular weights.

(4) Preparation of at least six simple organic substances, e.g., chloroform, Ether, Ethyl acetate, acetic anhydride, Urea, Nitrobenzene, aniline, Phenol, Benzoic acid (from Toluene) Iodobenzene, salicylic acid, an azo-dye, etc.

(5) Identification by chemical and physical tests of the following organic compounds:—

Methyl and Ethyl alcohols; acetone; chloroform; Formic, acetic, oxalic, tartaric, citric, Benzoic and phathalic acids; ethyl acetate and ethyl benzoate; urea, glucose, Benzene and Toluene, aniline, Phenol, Resorcinol, Pyrogallol, Benzaldehyde, acetophenone, Naphthalene and Naphthols.

Books for Study—

The same as for B.A.—Main—(New), 1933.

Chemistry (Subsidiary).

The Syllabus will include:—

(a) *General Chemistry*:—

The Atomic theory, Valency, Properties of solutions; osmotic pressure; Vapour pressure and freezing and boiling points. Velocity of reactions and the Law of Mass Action. Theory of electrolytic dissociation; transport numbers; conductivity. Thermo-chemistry, Relation of physical properties to chemical constitution.

(b) *Inorganic Chemistry.*—

The common elements studied in an elementary way from the standpoint of the Periodic classification.

(c) *Organic Chemistry.*—

Historical development of the Science. Purification of organic compounds, Qualitative and quantitative analysis, Isomerism, Polymerism.

Methane, ethylene, acetylene, methylhalides, methyl alcohol, ethyl alcohol, ether, acetaldehyde, acetone, acetic acid, ethyl acetate, acetamide, oxalic acid, glycerine, amines, fats, oils and soaps.

Benzene, nitrobenzene, aniline, Diazotisation, phenol, Toluene, benzyl alcohol; benzaldehyde, benzoic Acid.

(d) The course in Practical Chemistry shall be the same as that prescribed for the present B.A. (II-A) candidates.

Books for Study—

The same as for B.A.—Subsidiary—(New), 1933.

(iv) *Botany—Main.*

1. The main points of structure, development, life history and the taxonomic relation of the following groups in general and the Genera in particular:—

Bacteria.

Cyanophyceæ

Lyngbya, Gleocapsa, Oscillaria, Anabeæna, Nostoc, Rivularia.

Chlorophyceæ

Chlamydomonas, Gonium, Pandorina, Eudorina, Pleodorina, Volvox, Ulothrix, Oedogonium, Ulva, Enteromorpha, Coleochæte, Protococcus, Scenedesums, Hydrodictyon, Cladophora, Vaucheria, Caulerpa, Botrydium, Spirogyra, Mougeotia, Zygnema, Desmids, Chara, Nitella, Diatoms.

Phæophyceæ

Ectocarpus, Fucus, Sargassum, Dictyota, Padina.

Rhodophyceæ

Batrachospermum, Liagora, Polysiphonia, Gracilaria.

Phycomycetes.

Pythium, Phytophthora, Albugo, Mucor or Rhizopus, Pilobolus.

Ascomycetes.

Sphærotheca, Pyronema, Erysiphe, Peziza, Xylaria, Saccharomyces.

Basidiomycetes.

Ustilago, Puccinia, Agaricus, Polyporus, Lycoperdon, Ithyphallus.

Lichens

Bryophytes.

Riccia, Marchantia, Thalloid and leafy Jungermanias, Mosses.

Pteridophytes.—

Selaginella, Lycopodium, Isoetes, Ophioglossum, Gleichenia, Pteris or Nephrodium or Pleopeltis, Marsilia.

Gymnosperms.

Cycas, Pinus.

2. The external morphology of Flowering plants.

3. The general principles of classification and the distinguishing characteristics of the following Natural Orders as used in the Flora of British India:—

Magnoliaceæ	Apocynaceæ
Ranunculaceæ	Asclepiadeæ
Nymphaeaceæ	Boragineæ
Cruciferæ	Bignoniaceæ
Capparideæ	Convolvulaceæ
Guttiferæ	Solanaceæ
Malvaceæ	Scrophularineæ
Sterculiaceæ	Acanthaceæ
Tiliaceæ	Labiatæ
Geraniaceæ	Verbenaceæ
Rutaceæ	Ficoideæ
Meliaceæ	Amarantaceæ
Rhamneæ	Loranthaceæ
Sapindaceæ	Euphorbiaceæ
Anacardiaceæ	Urticaceæ
Papilionaceæ	Piperaceæ
Cæsalpineæ	Casuarineæ
Mimoseæ	Orchideæ
Rosaceæ	Scitaminaceæ
Combretaceæ	Amaryllideæ
Myrtaceæ	Liliaceæ
Lythraceæ	Commelinaceæ
Cucurbitaceæ	Hydrocharitaceæ
Umbelliferæ	Pontederiaceæ
Rubiaceæ	Palmeæ
Compositæ	Aroideæ
Sapotaceæ	Cyperaceæ
Oleaceæ	Gramineæ

4. *Plant Physiology.*

The chemical composition of the plant. Materials of plant food and their sources. The nature of soil and importance of its constituents and micro-organisms. Movements of water and gases. Assimilation of carbon and nitrogen. Transpiration and translocation of the assimilated products. Metabolism. Parasitism and other special modes of nutrition. Respiration. The influence of light, heat and gravity. Growth, movements and irritability in plants. Sexual reproduction and its significance. Vegetative reproduction. The phenomena of cross-fertilization. Variation, Heredity, and Mendelism. Theories of Evolution and Origin of Species.

5. *Histology.*

The structure and modes of the division of the cell, and the nature of its contents. The nature and mode of origin of plastids,

cell-sap and other cell-contents. The physical and chemical properties of protoplasm and cell wall. The origin, nature, and development of plant tissues. Primary and Secondary tissues, and their distribution in the plant body.

Practical Work.

Candidates are expected to be able to make permanent preparations illustrating the form and structure of any plant of the Groups or Orders mentioned in the syllabus and to describe them with sketches sufficient for their identification; to make dissections with the simple microscope of the floral parts of Phanerogams, and to make drawings, construct floral diagrams and refer them to their Natural Orders; to describe in technical language plants belonging to any of the Orders or Groups specified in the syllabus and to have done field work, under tuition, of at least five days in each year.

At the practical examination each candidate must submit his laboratory note-book, and a collection of named plants collected and preserved by himself.

Botany—Subsidiary.

(1) The structure and life history of the following:—

Bacteria, Oscillaria, Nostoc, Chlamydamonas, Pandorina, Eudorina, Pleodorina, Volvox, Ulothrix, Cladophora, Oedogonium, Spirogyra, Desmids, Diatoms, Ectocarpus, Fucus or Sargassum, Polysiphonia, Gracillaria, Nitella or Chara, Phytophthora, Rhizopus. Penicillium, Peziza, Puccinia, Agaricus, Riccia, Marchantia Mosses, Selaginella, Fern, Marsilia, Cycas, Pine.

(2) External Morphology of Flowers.

(3) The general principles of classification and the distinguishing characteristics of the following families:—

Anonaceæ, Nymphæace, Leguminosæ, Capparideæ, Malvaceæ, Sterculiaceæ, Tiliaceæ, Geraniaceæ, Rutaceæ, Meliaceæ. Rhamnaceæ, Combretaceæ, Myrtaceæ, Lythraceæ, Cucurbitaceæ, Umbelliferæ, Rubiaceæ, Compositæ, Apocynaceæ, Asclepiadaceæ Convolvulaceæ, Solanaceæ, Acanthaceæ, Labiataæ, Amarantaceæ, Euphorbiaceæ, Urticaceæ. Liliaceæ, Amaryllideæ Scitamineæ, Orchideæ, Palmæ, Cyperaceæ, Gramineæ.

(4) Plant Physiology:—

Chemical composition of the plant, soil, and its nature. Photo-synthesis, Transpiration, Respiration, Metabolism, Heterotrophic Plants, Growth, Movements, Irritability, Reproduction (Sexual and Asexual) Cross and Self Fertilization, Variation, Heredity and Mendelism. Theories of Evolution and the Origin of Species.

(5) Histology:—

Cell-structure and Cell-division, plastids, Cell-sap, other Cell-contents, the origin, nature and development of plant-tissues

Primary and Secondary tissues and their distribution in the plant-body.

Zoology—Main.

The Scope of Zoology.—The leading features in the structure, the important points concerning the development, the affinities, and the general classification of the forms included in the following groups (except in rare cases, no knowledge of extinct forms will be required):—

Protozoa. Porifera. Cœlenterata. Platynelmia. Nemertini. Nematoda. Acanthocephala. Chætognatha. Rotifera. Branchiopoda. Annelida. Phoronidea. Polyzoa. Arthropoda. Mollusca. Echinodermata. Chordata.

A general acquaintance with the vertebrate fauna of South India.

The geographical distribution of the more interesting groups of the Chordata.

Outlines of the theories of Organic Evolution, Heredity and Adaptation.

An elementary knowledge of the Cell and Cell-phenomena.

Candidates will be required to examine, describe, identify, or otherwise deal with specimens and preparations illustrating points of zoological interest in connection with any of the preceding groups. They will, in addition, be expected to have a full practical knowledge of the structure, and will be required to make dissections and simple microscopical preparations of any of the following types:—

Amœba. Vorticella. Hydra. Earthworm. Leech. Prawn and Crab (external characters). Scorpion. Centipede (external characters). Cockroach. Fresh-water Mussel. Ampullaria (Pila). Sepia. Amphioxus (preparations and sections.) Shark. Frog. Calotes. Pigeon and Hare.

Candidates may also be examined by *viva voce* questions.

*[At the Practical Examination, the candidates must submit their laboratory note-books.]

Zoology—Subsidiary.

The scope of Zoology:—The leading features in the structure, the most important points concerning the development, and the affinites of the forms included in the following Phyla in general and of the following types in particular.

Students will not be expected to be familiar with characters of orders or other sub-groups not mentioned in the following scheme.

Protozoa—*Rhizopoda.* (Lobosa, Foraminifera, Heliozoa and Radiolaria.)

Mastigophora. (Flagellata)

*With effect from the Examination of 1933.

Infusoria. (Ciliata)

Sporozoa.

Types : Amœba, Euglena, Volvox, Paramœcium, Vorticella, Monocystis and Malarial Parasite.

Cœlenterata—*Hydromedusæ.*—(Hydrida, Gymnoblastea, Anthomedusæ Calyptoblastca, Leptomedusæ, Trachymedusae, Narcomedusae, Hydrocorallina and Siphonophora).

Scyphomedusæ. (Stauromedusae, Coronata, Cubomedusae and Discomedusae).

Anthozoa. (Zoantharia and Alcyonaria)

Ctenophora.

Types: Hydra, Obelia, Aurelia, Sea-Anemone and Hormiphora.

Ptatyhelminthes—Types—Taenia and Liver-Fluke. (Fasciola).

Nemathelminthes—Type—Ascaris-

Annelida—Archiannelida.
Chaetopoda (Polychaeta and Oligochaeta)
Hirudinea
Echiuroidea

Types—Nereis, Earthworm and Leech.

Arthropoda—*Crustacea.* (Entomostraca and Malacostraca) Types—Streptocephalus, Lepas, Sacculina, Prawn and Crab.

Onycophora—Peripatus.

Myriapoda (Centipedes and Millipedes)

Insecta. Aptera, Orthoptera, Coleoptera, Neuroptera. Hymenoptera, Hemiptera, Diptera and Lepidoptera) Type—Cockroach.

Arachnida (Scorpions, Spiders and Kingcrab) Type—Scorpion.

Mollusca—Pelecypoda
Gastropoda
Cephalopoda

Types—Mussel, Chiton, Pila (Ampullaria) and Sepia. Echinodermata—
Asteroidea.
Ophiuroidea.
Echinoidea.
Holothuroidea.
Crinoidea.

Types-Star-fish, Brittle-star, Sea-urchin, Sea-Cucumber and Feather Star.

CHORDATA.

Prochordates—Balanoglossus, Ascidia and Amphioxus.

Vertebrata—Pisces—Elasmobranchii.
Teleostomi.
Dipnoi.

Amphibia ... { Anura
Urodela
Gymnophiona.

Reptilia ... { Lacertilia
Ophidia
Chelonia
Crocodilia

Aves ... { Archeornithes
Neornithes—(Ratitae and Carinatæ.)

Mammalia Prototheria

Metatheria ... { Diprotondontia
Polyprotedontia

Eutheria ... { Edentata
Sirenia
Cetacea
Proboscidea
Ungulata
Hyracoidea
Rodentia.
Carnivora
Insectivora
Chiroptera
Prosimiæ
Primates

Types—Balanoglossus, Ascidian, Amphioxus, Dog fish, Bony fish, Frog, Calotes, Pigeon and Rabbit.

A general knowledge of the theory of Evolution.

Practical Work.

Candidates will be expected to have a practical knowledge of the structure and shall be required to make dissections and simple microscopic preparations of any of the following types:—

Earthworm, Nereis, Leech, Prawn (external features); Scorpion; Cockroach; Fresh water Mussel, Ampullaria (Pila), Sepia (external features) Frog (sympathetic system and 7th cranial nerve excepted); Pigion, Rabbit (nerves excepted).

TEXT-BOOKS.

Zoology (Main) and (Subsidiary).

The same as those for B.A. Main and Subsidiary.

(vi) *Geology—Main.*

I. Physiography.

II. Mineralogy and Crystallography.

III. Petrology.

IV. Structural and Field Geology.

V. Stratigraphy and Palæontology.

(i) *Physiography.*

An elementary course of lectures on the following:—

The earth as a planet, its general relations to the other members of the solar system, hypotheses as to the origin of the earth; form, size and density of the earth; its movements and their effects.

The Atmosphere—its composition, height, density; pressure, temperature, moisture and movements; weather, refraction, twilight, and aurora-borealis.

The Hydrosphere—its composition, extent and distribution, depth, temperature and movements.

The Lithosphere—the chief constituents of the earth's crust, the general characters and mode of occurrence of igneous and sedimentary rocks. Condition of the interior of the earth.

Agents of geological change.—The hypogene and epigene agents of geological change, manner and results of their action, especially as influencing earth-sculpture—the destruction, construction, and gradual evolution of the crust of the earth and of its surface features.

Fossils, the main conditions favourable for their formation and preservation and their value as interpreters of the past history of the earth.

Climates—their causes and distribution; glacial epochs.

Simple facts about the geographical and geological distribution of the chief types of plant and animal life. Antiquity of man. Views as to the age of the earth's crust.

(ii) *Mineralogy and Crystallography.*

Symmetry; lines, planes and axes of symmetry; laws of Crystallography; the common holohedral, hemihedral and hemimorphic crystal forms and combinations under each of the six crystal systems; thirty-two types of crystal symmetry; the more important types of twins and twinning; grouping and irregularities of crystals, parting planes, percussion figures, etched figures; zonal characters; drawing of the more important crystal forms; systems of crystal notation, use of the contact and the reflecting Goniometer.

The principal physical properties of minerals which aid in the recognition of the various mineral species.

Isomorphism, paramorphism, pseudomorphism and dimorphism.

The chief characteristics of all the more abundant minerals including both those which are of geological interest and those of commercial value, the more important metallic ores, their modes of occurrence and uses, with special reference to India.

The practical determination of the chief physical and chemical properties of the commoner ores and minerals including the use of the blowpipe.

(iii) *Petrology.*

The classification and distribution of rocks, and the composition, structure, texture, origin and mode of occurrence of all the more important types and their metamorphic and altered forms.

Contact and Regional Metamorphism.

The macroscopic and microscopic examination of rocks including the determination of the simpler optical characters of the chief rock forming minerals in parallel polarized light. Preparation of diagrams or sketches to represent features observed in rock sections under the microscope. Construction and use of a simple petrological microscope. Mechanical separation of rock-constituents; determination of the nature and history of rocks by means of the microscope.

(iv) *Structural and Field Geology.*

The more important lithological and structural features of rocks, their origin or formation; structure of mineral veins. Diagrammatic sketches of the above.

Construction and Interpretation of geological maps and sections. Tracing of outcrops. Simple problems in Structural Geology.

(v) *Stratigraphy and Palaeontology.*

The chief petrological and palæontological characters of the main geological divisions and the probable physical conditions under which they were formed. Geology of India.

Fossils, their nature and preservation. The main groups of vegetable and animal life and their distribution in time.

The characters, classification and distribution of the more important types of fossils—especially Indian; identification and sketching of fossils; causes for the imperfection of the geological record: the general succession of life as revealed thereby and the general evidence furnished in support of evolution: principles of correlation; Homotaxis.

(vi) *Practical Examination.*

The knowledge of the candidate in accordance with the syllabus will be tested also by practical examination. *Viva voce* questions may be asked, some acquaintance with field work is necessary.

Geology—Subsidiary.

Minerology.—The more important rock-forming minerals, their composition and general physical characters and their characteristic alteration products. An elementary knowledge of crystallography is expected.

Petrology.—Origin, Classification and the distinctive characters of the leading types of sedimentary, igneous and metamorphic rocks.

Physical Geology.—The general nature and relation of the main agents of geological changes, epigene and hypogene; and their action.

Structural Geology.—Elementary knowledge of rock-structures, stractification, dip, strike, outcrop, outlier, inlier, folds; faults, cleavage, joints, unconformity and overlap; Surface-features as influenced by the nature and disposition of the rocks; water supply.

Statigraphical Geology.—Rocks as embodying the history of the earth; fossils, their mode of formation and value in geology and also in the biological sciences; the order of superposition; the geological record, its general conclusions relating to former changes in the physical features of the earth and also in the character of the organic forms; the order of succession of plant and animal life on the surface of the globe; the theory of evolution; an elementary knowledge of Indian Geology is required.

The practical examination may include the interpretation of maps and tectonic models and drawing of sections across them, of representations of scenery and also the identification and description of the more important types of minerals, rocks and fossils including models.

Candidates will be expected to show some acquaintances with field work.

B.Sc. Degree Examination.

1932 AND 1933.

ENGLISH.

The same Text-books as for B.A. (Honours) Preliminary Examinations, 1932 and 1933 respectively.

APPENDIX VI.

SYLLABUSES FOR THE B.Sc. DEGREE IN AGRICULTURE

AGRICULTURE INCLUDING ANIMAL HYGIENE

PART I

1. *Definition of Agriculture.*—Its importance and history, relation of science to agriculture.

2. *Geology.*—Origin of the earth's crust; formation of rocks and minerals and their classification; chief rocks and minerals of the Madras Presidency.

3. *Meteorology.*—Air, its composition; air movements; wind currents; monsoons. Rainfall and climate; factors which influence climate. Influence of climate and seasons on farming generally and with special reference to different parts of the Presidency. Weather forecasts; their objects.

4. *Soils.*—Formation, classification and properties. Soil and sub-soil. Soils of the Madras Presidency. Functions, sources of losses and gains to soils.

5. *Tillage.*—Necessity, methods and effects.

6. *Farm implements and machinery.*

(*a*) Ploughs and ploughing.

(*b*) Cultivators, harrows, hoes, grubbers, rollers, drills.

(*c*) Harvesting tools and machinery, threshing machines, winnows, gins.

(*d*) Carts and tools.

(*e*) Power cultivation.

7. *Soil fertility.*—Maintenance, rotations, fallows, and mixtures.

8. *Soil Improvement.*—Including soil reclamation, various methods adopted.

9. *Irrigation.*—Importance. Methods. Productive and protective irrigation works. Effects of irrigation works on the tract irrigated. Management of irrigated lands. Duty of water.

10. *Drainage.*—Importance, methods; relation of irrigation to drainage.

11. *Animal husbandry.*—Cattle, sheep and goats. Their importance to the farmer. Description of breeds and the breeding tracts of the cattle of the Presidency. Principle of feeding cattle, actual rations, their value and cost. Management of livestock,

their housing and care. Objects, principles and methods of breeding. Rearing of calves, sheep and goats—chief breeds, feeding and management.

Practical Work

The students will undergo practical training in all branches of farm work. In addition each student will himself cultivate half an acre of dry land and one-tenth of an acre of wet land and maintain cultivation sheets and observation note-books.

ANIMAL HYGIENE

Farm animals; the ox; buffalo, goat and sheep. Comparative study of the skeleton and principal organs of these animals the function of the digestive, circulatory, respiratory, urinary and genital systems. Care of animals in health and disease. Diagnosis of common ailments and treatment thereof by simple surgical and medicinal methods.

Students will receive practical training in handling and treating such animals, in performing simple operations and in mixing and administering simple medicines.

PART II

12. *Crops.*—Classification of crops: cereals, pulses, oil seeds, sugarcane, fibres, dyes, drugs and narcotics, fodder crops; fruits and vegetables and miscellaneous crops of the Presidency. The cultivation of the above in detail and their preparation for the market.

Coconut, palmyra and other trees of economic importance; market gardening; pastures; their management; hay and silage making, rotations, mixtures.

13. *Improvement of crops.*—Importance of seed selection, (*a*) single plant, and (*b*) bulk.

14. *Preservation and storage of seed.*—Drying, steeping and fumigation.

15. *Manures and manuring.*—Principles and classification. Farm yard manure; sheep manure; dung of horses and pigs; fish manure; guano; bones; bonemeal; soot; dried blood; slaughter-house refuse; night soil; poudrette; sewage; oil cakes; green and chemical manures.

16. *Dairy farming.*—Dairy cows, their feeding, management and breeding.

Dairy products, milk, physical properties, chemical composition, treatment and disposal.

Cream, separation, curdling of milk, starters, their object, skim milk, butter making, curds and ghee manufacture. Relation of bacteria to dairy.

Dairy equipment.—Building and machinery.

Dairy economics.

17. *Agricultural experiments.*—Objects and scope. Methods of conducting experiments. Calculation of experimental error.

18. *Farm management.*—Location and laying out of farms. Farm buildings, their location, arrangement and cost. Equipment, distribution and management of farm labour—human and animal.

Disposal of manure.

Systems of farming. Cost of cultivation of crops. Valuation of land and crops.

Farm accounts.

19. *Co-operative production and marketing of agricultural produce.*—Purchase of implements and manures.

Co-operative credit societies.

20. *Agricultural economics.*—Its relation to general economics. Theories of value and price. Laws of demand and supply. Markets. Factors of production—land, labour and capital.

Land Settlements.—Crop-cutting experiments, land tenures, permanent and ryotwari. Relation between landlord and tenant. Land acquisition and land alienation acts. Leases, assessment. Water rates, Large and small holdings. Fragmentation and consolidation of holdings.

Labour.—Skilled and unskilled. Permanent and casual. Wages, kind and money. Efficiency of labour.

Practical Work

Students will undergo practical training in all branches of animal husbandry, including management, handling and feeding. Practical dairy work, including handling and separation of milk, butter making, ghee manufacture.

Tours

They will also receive practical training in farm management. Every student will maintain an observation note-book in which details of practical work and other observations he makes from time to time will be recorded.

Excursions and tours in representative agricultural tracts shall also form part of the practical training.

AGRICULTURAL BOTANY.

PART 1

The external morphology of Angiosperms.—The general form, structure and modifications of root, stem, leaf, infloresence, flower, fruit and seed.

Histology.—The plant cell and the nature of its contents. Cell division. The chemical, physical and physiological characters of protoplasm. The different kinds of tissues, their origin, nature and development. Primary and secondary tissues and their distribution in the plant body. The plant skeleton and the tissues of which it is composed. The internal structure of normal roots, stems, leaves, anthers and ovules of plants.

Elements of vegetable physiology.—Absorption of water and gases and their movement in the plant. Photo-synthesis and synthesis of proteids. Translocation and storage of food materials and their digestion. Respiration in plants. Growth, movements and irritability in plants. Reproduction in plants. Dispersal of fruits and seeds.

The classification of flowering plants.—General principles. A knowledge of the general characters of the following Families or Natural Orders mainly based on crop plants, plants of economic importance and weeds. Anonacae. Cruciferae, Malvaceae, Rutaceae, Mitaceae, Anacardiaceae, Leguminosae, Myrtaceae, Cucurbitaceae, Umbelliferae, Rubiaceae, Compositae, Asclepiadeae, Convolvulaceae, Solanaceae, Labiatae, Amarantaceae, Piperaceae, Euphorbiaceae, Urticaceae, Scitamineae, Amaryllideae, Liliaceae, Palmeae, Aroideae Cyperaceae and Gramineae.

Physiology and Ecology of Plants.—The water culture or sand culture method of rearing plants. Chemical composition of plants. The essential and non-essential elements of plant food. Sources of energy in plants. Enzymes and their action. Special modes of nutrition in plants.

External factors and their influences on the plant. Distribution of plants and the factors governing it with special reference to common weeds and crop plants. Different types of vegetation, such as Xerophytes, Mesophytes, Halophytes and Hydrophytes.

Practical Work.

Students will examine and describe plants of the families or groups specified in the syllabus, make dissections and drawings of the various parts of plants and construct floral diagrams and prepare sections of parts of plants for the microscope so as to illustrate their structure. They will carry out simple experiments in plant physiology.

AGRICULTURAL BOTANY INCLUDING MYCOLOGY

PART II

Agricultural Botany.—The cultivated plants and their origin. Differences between cultivated and wild plants. Methods of improvement of crops. Seed testing. Recognition of the seeds of the common weeds and crop plants. The morphology and physiology of the cereals, pulses, fibre plants, vegetables, oil-seeds and the chief industrial and economic crops under cultivation.

Vegetative and sexual reproduction. Cross and self-fertilization. Principles of heredity, mendelism and plant breeding. Theories of evolution, variation and origin of species.

Horticulture.—The principal horticultural operations. Methods of grafting, budding and pruning. General methods of propagation of plants. Recognition of the common fruits and fruit trees.

Cryptogams.—The main points of structure, development and life history of the following groups:—Blue green and Green-Algæ, Charceæ, Bryophyta, Filicineæ and Lycopodineæ.

Mycology.—The structure of fungi—their modes of nutrition and reproduction. Dissemination of fungi and infection of host plants. Effect of fungi on host plants. Methods of control of plant diseases. Classification of fungi and the character of the main groups. Disease of crops.

Practical Work

Candidates will examine the common weeds growing in cultivated fields and their seeds, graft and bud fruit trees and flower shrubs, recognize, describe and refer to their families crop plants and dissect and prepare sections to illustrate their structure under the simple and compound microscopes.

In Mycology they will observe the simple laboratory method of examining a diseased plant, planting and culture, etc., and simple infection experiments.

AGRICULTURAL CHEMISTRY.

PART I

A. Inorganic Chemistry.—Portions done in the Intermediate Course to be revised, with special reference to general principles.

B. *Organic Chemistry.*—Composition, purification and analysis of organic compounds. Classification, compound radicles, open and closed chains. Saturated and unsaturated compounds. Constitutional formulae. Isomerism, metamerism, polymerism.

The hydrocarbons of the methane, ethylene and acetylene series. General properties.

Monhydric alcohols. Alcoholic fermentation. Wood spirit Ether. Aldehydes and ketones. Fatty acids and their derivatives. Esters. Amines. Cyanagen compounds, Cyanomide, Aminoacides. Urea and ureides, Glycol, Lactic, Oxalic, succinic; malic; tartaric; and citric acids.

Glycerine, fats, oils and soaps.

The carbohydrates. Optical activity. The polariscope.

Aromatic compounds.—Benzene and its cheif derivatives. The phenols. Aromatic aldehydes, ketones and quinones, Tannin, indigo, alkaloids, glucosides and essential oils. The proteins.

C. *The Soil.*—Physical properties. Mechanical analysis. Relation of soils to water. Relation of soils to temperature. Soil gases. Reactions taking place in soils. Dormant and available plant food. Retention of bases and acids. Chemical analysis. Interpretation of results. Injurious salts in soil. Alkaline lands and their formation and amelioration.

Biological action in soil, and breakdown of carbohydrate and protein material.

Practical

A. Qualitative analysis of salts or simple mixtures of salts, containing bases and acids of common occurrence and of agricultural importance.

B. Identification of commonly occurring organic substances, e.g., important carbohydrates—acids, such as acetic, lactic, oxalic, tartaric, citric and hydrocyanic and alkaloids—general tests.

C. *Volumetric analysis.*—Acidimetry, alkalimetry, determinations employing permanganate, iodine and thiosulphate and silver nitrate.

D. Gravimetric estimation of iron, aluminium, calcium, magnesium and potassium and sulphuric, hydrochloric, phosphoric and carbonic acids.

E. Examination of soils for physical properties. Mechanical analysis. Fixation of salts. Chemical analysis. Nitrification.

PART II.

Manures.—Necessity for manures. Soil exhaustion, minimum cropping value. Limiting factories. Classification of manures. The chief nitrogenous, phosphatic and potash manures, their manufacture, application and modes of action. Conservation of farm yard manure. Green manures. Analysis and valuation of manures.

Chemistry of the plant.—Essential elements of plants and their functions. Proximate constituents of plants. Chemical changes occurring during germination and growth. Photosynthesis. Important enzymes and their action. Analysis of plants and general composition of South Indian crops. Chemistry of crop products.

Animal Chemistry.—Composition of the animal. Composition of fodders and feeding stuffs and their analysis. Function of different nutrients. Vitamines. Digestion and absorption. Digestive co-efficients. Nutritive ratios. Calorific values. Starch equivalents. Formation of flesh, fat and milk. Feeding standards. Calculation of rations. Manurial values of foods.

Dairy Chemistry.—Composition of milk and milk products. Physical and chemical properties. Analysis and detection of adulteration. Bacteria in general relation to the dairy.

Practical.

Estimation of nitrogen by Kjeldahl's method and calorimetric estimation of ammonia and nitrates.

Analysis of manures.

Analysis of feeding stuffs and fodders.

Analysis of milk and butter.

Estimation of important carbohydrates:—Starch, sucrose, and glucose.

Examination of commonly occurring fats and oils—adulteration.

Estimation of oils in oil-seeds.

Examination of the more important vegetable and animal proteins.

Examination of water for irrigation purposes.

Syllabus of studies in Agricultural Zoology

Relation of Zoology to Agriculture. Scope of Zoology. The different aspects of zoological study. The most important points concerning the structure, the binomics, and the affinities of typical or familiar forms in the following groups with special reference to forms of economic importance.

Protozoa, Porifera, Coelenterata, Vermes, Echinodermata, Mollusca, Arthropoda, Fishes, Amphibians, Reptiles, Birds, Mammals.

Economic and applied entomology. Insects and man. Insect pests. Principles governing increase and decrease of pests. Methods of pest control. Insect pests of different orders, such as grasshopper pests, beetle pests, etc. Pests of different kinds of crops. Pests of stored products. Pests of cattle. Household pests. Disease carriers. Useful and beneficial insects.

Practical.—A practical knowledge of the general form and the main differentiating features of the types.

Amoeba, Paramoecium, Earthworm, Prawn (external characters only), Scorpion, Cockroach, Fresh Water Mussel (external characters), Fish (external characters), Frog, Fowl and Rat.

Identification and investigation of the important insect pests of South India. Practical observation of the collection, rearing and preservation of insects and methods of control against pests.

Agricultural Engineering

Elementary surveying and levelling. The use of the chain, prismatic compass and plane table, mensuration.

Plan drawing, estimating the construction of simple buildings and machines. Elementary applied mechanics.

Farm machinery, sources of power.

Elementary Hydraulics, gauging flow of water in channels and pipes.

Practical handling of farm machinery and engines.

Practical carpentry and smithy work.

APPENDIX VII.

L. T. DEGREE EXAMINATION.

The following syllabuses for the subjects of the Examination have been prescribed:—

THE THEORY AND PRACTICE OF EDUCATION.

A

Physiology in relation to child and school hygiene. Study of the human organism: the different systems of the organism: the diseases of each and their prevention: unhygienic habits and their results; responsibility of the teacher; medical inspection; the function of the teacher in this connection. Physical growth of the individual and the physiological changes characteristic of each stage of development; physical culture, and games. Environment of the child: school buildings, furniture, sanitation, playgrounds—consideration of the new psychology in this connection.

B

Psychology in relation to the child and his development. The physiological basis of mental life. The mechanism of reaction: stimulus and response. Heredity and environment. Instincts. The senses: the purpose and methods of sense-training. Development of intellect: sensation, perception, conception, apperception, memory, association, imagination, reasoning and judgment. The emotions. Volition: the question of freedom. Individuality. Stages of mental development. The laws of learning. Imitation, play, habit-formation, attention, interest and effort. Fatigue, physical and mental. Intelligence testing, its purpose and achievements. The Group mind. Suggestion. The Unconscious in education.

C

Principles and methods of instruction, organisation and discipline in schools. Ideals and aims in education. Principles of the curriculum. The question of formal training. Correlation in teaching. The logical and psychological order. Factors and methods in the training of thought: analysis of a complete act of thought. Methods of discovery, verification and proof. Definition and its place in education. The place of language in education. Technique of teaching: inductive and deductive development; exposition and illustration; discussion and questioning. Individual and group work. Exercises; testing, old and modern methods; reports; examinations. The grading of pupils. Time-tables: sequence of lessons. Homework; its purpose and organisation. The promotion of corporate school life; school societies,

prefects, Out-of-school activities: games; Scouts and Guides, leisure time and hobbies. Discipline, its nature and meaning; its relation to character and self-control; the question of punishment out-of-school influences; co-operation between home and school.

A subject for special study.

For 1931: Recent methods of measuring achievement.

Books for reference for the special subject.

1. How to measure in Education: McCall, (Macmillan & Co.).

2. How to measure: Wilson and Hoke: (Macmillan & Co.).

3. The use and interpretation of Educational Tests: Greene and Jorgensen (Longmans, Green & Co.).

4. Measuring the results of Teaching: W. S. Monroe (Houghton, Mifflin & Co.).

5. Tests and Measurements in High School Instruction: Huch and Stoddard (World Book Company).

6. The Art of Interrogation: E. R. Hamilton (Kegan Paul).

7. Preparation and use of New Type Examinations: Paterson (World Book Company).

8. Mental and Scholastic Tests: Burt (King & Son).

9. A Primer of Graphics and Statistics for Teachers: H. O. Rugg (Houghton, Miffin & Co.).

10. Fundamentals of Statistics: Thurstone (Macmillan & Co.).

Also relevant articles in current Educational Magazines.

D (1)—ENGLISH.

I. *General.*—Objects of teaching English—its practical and cultural values. The position of English in India; the bilingual problem and its implications—(*a*) English a medium of instruction, (*b*) high standard of attainment, (*c*) colloquial as well as literary English.

II. *Methods of Teaching*—

(*a*) The translation method of teaching English in India; its defects, comparison of English and Indian languages. Traditional method of language study.

(*b*) The Reformed method. Its meaning, object and importance in relation to the aim of teaching English. The inhibition of the mother tongue as far as possible; the foreign tongue the medium of instruction. Results—fluency of expression, oral and written.

III. *Oral work.*—Its prominence in the initial stages—

(*a*) Phonetics. The value of phonetics—its importance to teachers in English—the value of phonetics and phonetic drill.

The sounds of English—detailed study of their production—comparison of English and Indian sounds—methods of teaching:—(1) phonetic drill, (2) apparatus, (3) use of phonetic symbols. Value of phonetic texts (1) for teachers, (2) for pupils.

(*b*) Conversation: precedes reading.

Subjects: Class-room objects; persons; actions, pictures; conversation between pupils. Importance of repetition.

IV. *The Text.*—The centre of instruction; extent to which digression is desirable. Methods of explanation—use of objects, actions, gestures and pictures; forms of verbal explanation—the apperceptive principle; the use of mother tongue, extent to which it may be used. Importance of study of language; drill in word and phrase; oral composition; means of extending vocabulary—word and phrase books—their arrangement. The requisites of a good reader—consideration of existing readers.

English life (customs, society, schools, etc. stage at which to introduce; consideration of difficulties; contrast between conditions of Indian pupils and, *e.g.*, French pupils in this respect.

Elementary study of diction in texts. Choice of words; prose and poetic diction; attention to concrete expression; rhyme and metre.

Intensive and extensive reading. The function and treatment of non-detailed texts. Creation of interest in reading. The importance of silent reading. The formation and use of class libraries.

Reading aloud and recitation from texts—pronunciation, punctuation, phrasing, intonation, stress.

V. *Grammar.*—Distinction between Grammar common to all languages and the grammar of a particular language. The need for uniformity in grammatical terms in English. The place of grammar in the reformed method of language teaching. Inductive methods; correlation with texts. The function and form of words; word order; sentence structure; importance of analysis.

Grammar summaries and framing of rules. Grammar drill. Framing of grammar syllabuses. The medium of instruction.

VI. *Hand-writing.*—Outline of work in initial stages—writing charts, copy-books; transcription from texts; spelling; dictation. Importance of punctuation; syllabification in writing, difficulties arising from vernacular practice. Attention to hand-writing in exercise books, note-books and composition.

VII. *Composition.*—Correlation with texts, grammar and word-lists. Progress from reproduction to free composition; importance of oral work. Story reproduction; use of pictures: use of texts; correlation with other subjects; current events. Types of composition; (*a*) Essay—narrative—descriptive, etc., (*b*) Letter-writing, (*c*) Epitome, (*d*) Expansion, (*e*) Paraphrase. Translation; principles of translation; stage at which it should be introduced.

The construction of the essay—principles of sentence and paragraph structure. Oral and written preparation essential. Correction and valuation of written exercises. The difficulty of large classes.

VIII. Organisation of English teaching in schools. Time-tables, free and rigid. Schemes of work; syllabuses. Notes of lessons; note-books. Class-rooms; Libraries.

D (2) (*a*)—CHILD EDUCATION.

Principles and methods of Child Study.

History of Child Education with special reference to Rousseau. Pestalozzi, Froebel and Montessori.

Experimental observations; Physiological considerations; the child's instincts.

Stages of child development—study of exceptional children and methods of dealing with them.

Mental Intelligence Tests.

II. A survey of recent experiments in methods of child education.

Theories of play and play methods: Importance of play in the development of the child. Free and organised play: Consideration of the choice of a child's play-things and occupation materials.

III. Self-activity, continuity, connectedness and creativeness as guiding principles in early education.

IV. Sense training; its importance in the teaching of

(*a*) Language, number and space.

(b) **Natural interests.**

(c) **Class singing with special emphasis on rhythm; Simple eurhythmics.**

(d) **Drawing and handwork.**

(e) **Story and dramatisation.**

V. Correlation in the teaching of the various subjects, in the framing of syllabuses and time-tables and in the application of the project method.

VI. Environment. Fatigue. Discipline.

D (2) (b)—MATHEMATICS.

i. *Mathematics and Mathematical knowledge.*—The nature and scope of mathematics; its relation to other branches of knowledge, *e.g.*, physical and natural sciences, logic, philosophy, economics. Value of mathematical education: Practical and Cultural.

The development of mathematical knowledge by empirical, intuitional and rational processes. Working knowledge *versus* knowledge of principles underlying the processes.

The fundamental concepts of Elementary Mathematics in relation to teaching.

ii. *History of Mathematics.*—The value of the study of history of Mathematics and Mathematical teaching:—History of the important topics of elementary mathematics, *e.g.*, notation, metric system, directed numbers, function concept, parallel postulate.

Contribution to the pedagogy of mathematics by eminent educators, *e.g.*, Froebel, Herbart, Montessori.

Methods of mathematics—the scientific, deductive, intuitional and creative.

Modern tendencies in the teaching of school mathematics.

III. *Methods of Teaching Mathematics.*—The heuristic and laboratory; synthetical and analytical; inductive and deductive; genetic and other methods, singly or in combination.

Experimental and practical mathematics. The organisation and functions of mathematical laboratories. Outdoor work.

Means of securing speed and accuracy in mathematical work. Oral and written work.

IV. *The content and organisation of school mathematics.*—Organisation of school mathematics, primary, lower and upper secondary. Compulsory and elective courses.

Curriculum construction. The psychological *versus* logical order of development. The concentric *versus* the continuous development. The syllabus and assignments.

Separate treatment of Arithmetic, Algebra and Geometry *re* aims of teaching, position in the curriculum, organisation of subject-matter, methods of teaching, etc.

Correlation of Arithmetic, Algebra and Geometry and of mathematics with other school subjects.

A detailed study of the Madras S.S.L.C. and Matriculation syllabuses in elementary and optional mathematics.

Mathematical libraries. Students' associations.

V. *Problems bearing on the conduct of mathematical work.*—The medium of instruction.

Text-books: their place and value. A critical study of text-books.

Notes of lessons and teacher's records of work.

Individual, group and class teaching. The Dalton plan and supervised study of mathematics.

Problems and problem solving. Project method. Collection of data for problems, Indigenous methods of calculation.

VI. Examinations, Valuation of Answers. Modern tests. Standards of achievement. Treatment of Errors.

Fundamental notions of Statistical averages and correlation as applied to educational problems.

D (2) (*c*)—PHYSICAL SCIENCE.

Aims of science teaching—the acquisition of useful knowledge by discovery; and exposition of the scientific or laboratory method of training. Methods not the verification of previously known facts, but finding out by means of experiment; learning by doing; training in self-reliance.

Three stages—(*a*) observational, (*b*) heuristic, (*c*) systematic.

Two objects, the acquirement of skill and of knowledge. Intensive method; necessity of definite conceptions.

Physical science, a sequence to elementary natural science. Co-ordination, and correlation with natural science, mathematics drawing, geography.

Didacticism opposed to the scientific method; critical appreciation of authority.

Methods of recording work, observational and experimental.

Drawing up syllabuses and laboratory courses; continuity; sequence; directiveness. Organization and fitting up of laboratory. Induction and deduction, synthesis and analysis, in their application to the study of science. Function of hypotheses and their potency in relation to science.

Historical considerations in the study of science. Place of quantitative work in a school course.

D (2) (*d*)—NATURAL SCIENCE.

Aims of teaching Natural Science—Acquisition of knowledge by discovery. Methods not the verification of previously known facts, but finding out by observation and experiment.

Elementary Natural Science.—a Science chiefly of observation. The teaching of Natural Science may be used as (i) a training in accuracy of observation, (ii) a training in discovery of laws governing the relationships of living things to external conditions by experimental work, and therefore of the characters of the animate world, (iii) a training in finding out the principles of classification and the relationships of families.

Combination of observational and heuristic methods of teaching. Drawing and description in relation to correct observation. Sketches to be made from the actual objects themselves.

The value of comparison.

Consideration of the characteristics of some natural orders of plants. Principles of classification with special reference to botanical system of classification. Natural and artificial systems of classification.

Arrangement of apparatus for experiments; Conducting experiments. Selection of specimens for different lessons. Value of living specimens. Necessity for an acquaintance with dried specimens to a certain extent.

The value of school museum. Fitting up and maintenance of a school museum. Necessity for observing economy in maintaining a school museum. Methods of preserving and labelling specimens. Value of Photographs. Use of the magic lantern.

School herbarium. Selection of plants for the herbarium. Methods of preparing herbarium specimens. Encouragement of the collection of specimens.

Value of a school garden and of excursions

D (2) (*e*)—HISTORY.

1. *The Meaning of History.*—Considered as (i) a Philosophy, (ii) a Science.

2. *Scope.*—The subject-matter of history—its branches, social, political, economic.

3. *The Value of Historical Study.*—

(*a*) Cultural—study of human nature; breadth of outlook.

(*b*) Practical—a school of citizenship.

(*c*) Ethical—training of character; instrument of moral training—patriotism.

(*d*) Mental training—mental processes involved—analysis, classification, generalisation, comparison, criticism, judgment.

4. *Aims of Teaching.*—

General—

(*a*) To develop a historical sense—the creation of interest in the past and understanding of the present.

(*b*) To secure the intelligent use of books and training in individual work.

Special—

Early stages.—To create interest and develop imagination.

Later stages.—To train the intellect; logical—critical—selective—descriptive powers.

5. *The Subject Matter*—

(*a*) Principle of selection for early and later stages—psychological—logical.

General, national and local history; ancient and modern history.

(*b*) Organisation: Concentric and periodic system; outlines and special periods; chronological and topical treatment.

(*c*) Correlation with other subjects, *e.g.*, Civics—Geography—Literature.

6. *Method*—

General—

(*a*) Oral teaching—logical series of questions with definite aim essential—teaching as opposed to lecturing.

(*b*) Use of text-book—emphasis and expansion of important points—selection of topics.

(*c*) Preparation—notes—Bibliography—maps and charts.

(*d*) Supervision of individual work in class as opposed to dictation of notes.

Special—

Early stages.—Narrative—biography—ballad—dramatisation— illustration—maps—museum—excursions.

Later stages—

Class work:

Oral teaching—its importance—questioning to test memory and provoke thought—analogies and illustrations—maps—charts—pictures—models. Museum—excursions.

Individual work—

(*a*) The text-book—its use at home and in class—characteristics of good and bad text-books.

(*b*) Collateral reading—its purpose—assignments and guidance.

(*c*) Study of sources—method—value—limitations.

(*d*) Maintenance of note-books.

(*e*) Problems and exercises.

(*f*) Preparation of maps, plans and charts with reference to (*a*) time, (*b*) casual relations.

7. *Preparation of Courses of Study.—Syllabuses*—schemes of lessons—critical study of schemes in use.

8. *The medium of Instruction in Indian schools.*

9. *Laboratory work in History.—Its* value, possibilities and limitations—requisites—library—source books—equipment—study hours—assignments.

10. *Examinations in History.*—Oral and written—their aims and value. Standard tests. The valuation of papers.

D (2) (*f*)—GEOGRAPHY.

1. Scope of modern geography, its essential principles and larger problems and a brief historical sketch of the growth of modern geography, and its pedagogy.

2. The scope and purpose of geography in schools, its educational value and its relation to the other subjects of the curri-

culum, *e.g.*, Science Subjects, Mathematics, History, Drawing, Hand-work.

3. The organization of courses of study and the construction of syllabuses, with special reference to the following:—

(*a*) the environment of the school (rural or urban);

(*b*) the type of the school (secondary or elementary);

(*c*) correlation with the courses in other subjects;

(*d*) the value of descriptive and argumentative geography at different stages in the course;

(*e*) the position of physical, economic, historical and regional (including home) geography in a scheme of school work;

(*f*) the value and possibilities of practical work including map drawing and elementary cartography, observational work, out-door work and excursions and quantitative work.

4. Preparation, organization and conduct of lessons, types of lessons, causal relation and the place and value of geographical explanations—the adaptation of teaching of geography to systems of auto-education or laboratory methods.

5. Examinations and test papers.

6. Sources of geographical information and collateral reading.

7. Geographical equipment and its use.

D (2) (*g*)—SANSKRIT.

(a) General: Preliminary

Objects of teaching Sanskrit. The standard to be aimed at in Secondary Schools and Pre-collegiate Sanskrit Schools. The position of Sanskrit in India; its cultural and practical value. The inter-relations of Sanskrit and Indian vernaculars. Comparison of Sanskrit and English, with particular reference to their Grammar and structure. Practical and theoretical study of Sanskrit.

(b) Methods of Teaching

The translation method and the direct method as applied to Sanskrit study; traditional methods of Sanskrit study—their merits and defects, the external and internal difficulties of the Sanskrit language and how best to overcome them.

(c) The Early Stages of Sanskrit Teaching.

The sounds of Sanskrit, detailed study of their production, the organic and acoustic methods of studying Sanskrit sounds. The means of teaching them to pupils. The teaching of Sanskrit handwriting; the place of dictation and transcription; translation. Reading and recitation. The Sanskrit text as the centre of instruction; manner of exposition, means of extending the Sanskrit vocabulary. Inductive methods of Sanskrit teaching. Sanskrit Grammar. The use of Sanskrit *Kosas.*

(d) The Later Stages.

The choice of Sanskrit texts. Lines of development in teaching the various aspects of Indian life. Correlation with the Geography and History of India. Correlation with the History of Indian civilization and culture. Study of diction in Sanskrit texts; types of Sanskrit Composition. Sentence structure in Sanskrit. Paraphrase and translation with reference to Sanskrit. The Historical and Comparative Methods of studying the Sanskrit Language and Literature. Study of Organization of Sanskrit teaching in English schools; consideration of time-tables; formation of class libraries and general libraries.

D (2) (H) DOMESTIC SCIENCE.

Detailed syllabus showing the scope of Domestic Science as a School subject.

SUGGESTED TEXT-BOOKS : *Parts* of the following :—

Macnally's Sanitary Hand-book for India, 6th edition, revised and re-written by A. G. A. Russell, printed by the Superintendent, Government Press, Madras.

A Treatise on Hygiene and Public Health: with special reference to the tropics, by Birendra Nath Ghosh, 5th edition, Calcutta Scientific Publishing Co., 1924.

Pre-Requisite: It is suggested that as a knowledge of Chemistry and Biology is essential to the understanding of the subject, this course be open to Natural Science graduates or Chemistry graduates only.

It is assumed that the elements of Physiology and Personal Hygiene are known to the students.

SYLLABUS

PART I—NUTRITION

(*a*) Their main divisions, *i.e.*, carbohydrates, fats, proteins, minerals water, vitamins.

(*b*) The importance to the body of each constituent.

(*c*) The amount required of each constituent.

2. The cooking of food: Its underlying principles; use and care of fuels; practical work. (See detailed syllabus.)

3. The composition of common foods: a general study by means of charts and diagrams of the relative amount of the above constituents in the foods in every day use.

4. Planning of balanced dieteries for infants, growing children, adults, the aged, expectant and nursing mothers, invalids.

5. Food adulteration.

6. Wise purchase of food.

7. Vegetable foods *vs.* animal foods for diet in India.

Part II—Hygiene and Sanitation

I. *Parasites of Man*:

(*a*) Vegetable parasites:

(1) Yeasts; their relation to (i) Bread-making; (Practical work: the preparation of yeast and making of appams and bread), (ii) Fermentation; (Experiments to show fermentation).

(2) Moulds: illustrated by experiment.

(3) Bacteria: (i) useful bacteria, *e.g.*, those concerned with putrifaction and decay, and those that take nitrogen from the air for the leguminous grains or pulses, (ii) harmful bacteria—considered under a separate heading.

(*b*) Animal Parasites:

(1) Protozoa, *e.g.*, malarial parasite.

(2) Metazoa, *e.g.*, hook-worm, tape-worm.

(3) Temporary parasite: bed bugs, lice, etc.

Means of prevention and destruction.

II. *Communicable Diseases*:

(*a*) Prevention; incubation period, symptoms, Treatment of—

(1) Diseases carried by insects; *e.g.*, plague, malaria, typhoid, dysentery, sore-eyes.

(2) Diseases carried by bacteria floating in the air; *e.g.*, tuberculosis, colds, coughs.

(3) Diseases communicated through direct or indirect contact; *e.g.*, small-pox, measles, scabies, whooping cough.

(*b*) Susceptibility and immunity: the significance and importance of vaccination and inoculation.

(*c*) Care of patients with communicable diseases for the benefit of both the patient and the community.

(*d*) Personal cleanliness: baths (hot and cold), use of soap, cosmetics, etc.

III. *House-Planning*: according to sanitary principles with attention to.

(*a*) Water-supply.

(*b*) Drainage and conservancy.

(*c*) Ventilation and lighting.

(*d*) Care of house, fittings, furniture, decoration.

IV. *Excursions*: to see the public market, slaughter-house, water-works, sweeper villages, drainage systems, etc.

PART III—CHILD WELFARE IN HOME AND COMMUNITY

I. *Causes of Infant Mortality.*

(*a*) The evils of child-marriage, and the marriage of the deceased and feeble-minded.

(*b*) Importance of pre-natal care for mother and child.

(*c*) Importance of skilled attendance and absolute cleanliness at birth.

(*d*) Correct feeding of the child up to fifth year and feeding of mother while nursing

(*e*) Clothing, sleep, cleanliness, illness of the infant.

(*f*) Training of the infant in the right physical habits.

II. *Visits* to Child Welfare centres and baby clinics in hospitals, to see the above principles in practice.

III. *Correlation* with the Psychology and School Hygiene courses in the discussion of the training of children.

IV. *Treatment of Accidents and Injuries.*

PART IV—THE FAMILY INCOME

I. The principles of family expenditure.

II. The meaning and importance of a budget. Preparation of monthly and annual budgets.

III. The keeping of family accounts.

IV. The evils of debt.

Plan for a Practical Course in the Principles and Practice of Cooking.

1. *Equipment.*—A laboratory—kitchen. *For each member of the class,* a small earthen fire-place and a complete set of small utensils. *For the whole class,* grinding stones, one large fire-place, one set of large utensils, dishes for serving cooked food, microscope, test-tubes and spirit lamps, foodscales, measures, pickle-jars, outfit for pasteurization of milk.

2. *Individual work.*—Except where it is impossible to cook in small quantities, each member of the class should work alone.

3. *Correlation.*—The course is directly correlated with the theoretical work in Nutrition, Child Welfare, and should be given either as part of, or parallel to, the theory classes, just as experimental work and theory are combined in Chemistry.

1. (*a*) *Carbohydrates*:

(1) *General Principles.*—Starch: A study of starch grains under the microscope. Test for starch. Experiments to show effect of saliva upon starch, effect of heat upon starch. General principles of cooking starch. The use of *leavening agents* (*soda, etc.*), in cooking.

(2) *Preparation.*—Rice. Comparison of different kinds, before and after cooking. Preparation of paddy. Cooking of rice in different ways. Making of preparations from rice-flour,—as *appam, idli, vivikkai, puttoo, palagarams.*

(3) *Wheat*: Preparation of rolong, wheat-flour, and cracked wheat, and the use of these in cooking *conjees, puttoo, uppumavoo, palagarams, luddoo, chupatties, poories.*

Ragi, Kambu, Cholam } A comparative study of their grains, their preparations, and use in *conjee, puttoo*, and bread.

Barley: Use of barley-water and barley *Conjee* for infants and invalids.

(*a*) *Potatoes*: Various preparations.

(*b*) *Sugar.*—Comparison of various sugars, e.g., jaggery, cane-sugar, milk-sugar, fruit-sugar, glucose.

Experiments to show the different stages in the boiling of sugar.

Preparation of various sweets.

II. *Fats.*—Comparison of different oils. Their use in cooking. Preparation of curds, butter-milk and ghee. General principles of frying.

III. *Proteins:*

(1) *General Principles.*—Test for protein. Digestion of protein in a test-tube by artificial gastric-juice. Study of effect of heat on albumen.

(2) *Preparation.*—(N.B.—Sub-sections (*a*), (*b*) and (*c*) are optional.)

(*a*) *Mutton.*—A study of the different parts of the animal, and their use in cooking. Cooking of these different parts in curries, cutlets and soup. Preservation of mutton.

(*b*) *Fowl and Fish*—Choice and preparation of fish and fowls for cooking. Cooking in various ways, including soup. Preservation of fish.

(*c*) *Eggs.*—The choice and purchase of eggs. Boiling of egg in a test-tube to watch the different stages in coagulation.

Preparation of eggs in various ways, *e.g.*, egg-flip, omelet, poached, custards, etc., use of eggs in baked and fried cakes.

(*d*) *Leguminous vegetables.*—Preparation of dhal beans, and gram in curries and vadais, *palagarams, omapodi, thosai, murukku, etc.* Roasting of peas, ground-nuts, bengal-gram, and their nutritive value.

IV. *Minerals and Vitamins.*—Cooking of fruit and vegetables. Preservation of fruits and vegetables *e.g.*, lime-pickle, mango-pickle, cucumber-pickle, etc.; spicing.

V. Beverages.—Preparation and comparative value of coffee, tea and cocoa.

To be done in connection with lesson on Child Welfare The testing and care of milk. Preparation of bottles for infants of different ages. Pasteurization.

The testing and treatment of drinking-waters; preparation and care of filters.

APPENDIX VIII.

EXAMINATIONS IN LAW

Note 1.—No special text-books in the case of Acts of the Indian Legislature are prescribed, but students will be expected to have a mastery of the matter which is usually contained in the best commentaries as well as a knowledge of the bare text of the Act.

2. Text-books have been prescribed where necessary with a view to indicating the general scope of each subject, but questions will not be confined to the books prescribed.

FIRST EXAMINATION IN LAW

1. *Jurisprudence*:—

   1. Salmond: Jurisprudence.
   2. Maine's Ancient Law, Ed. Pollock.

2. *Roman Law*:—

   1. Moyle's Translation of Justinian.
   2. Leage: Roman Private Law,

      or

      Buckland: Elements of Roman Law.

3. *Contracts*:—

   1. Anson's Law of Contracts.
   2. Pollock and Mulla—Indian Contract Act.

4. *Torts*:—

   Pollock on Torts.

5. *Indian Constitutional Law*:—

   1. Ilbert: Government of India.
   2. Cowell: Courts and Legislative Authorities in India.
   3. Trevelyan: Civil Courts of British India.
   4. Government of India Act of 1919 and Rules made thereunder.

B. L. DEGREE EXAMINATION.

1. *Property*:—

Williams: Real Property.

Strahan: Equity.

2. *Hindu Law*:—

Mayne's Hindu Law and Usage.

3. *Muhammadan Law*:—

Mulla's Muhammadan Law.

4. *Criminal Law*:—

Kenny: Outlines of Criminal Law—Indian Penal Code.

5. *Evidence*:—

Willis on Evidence.

The Indian Evidence Act.

6. *Land Tenures*:—

Soundararaj Iyengar: Indian Land Tenures.

M.L. DEGREE EXAMINATION

BRANCH I—JURISPRUDENCE.

1. *General Jurisprudence*:—

Austin: Lectures on Jurisprudence.

Jethro Brown: The Austinian Theory of Law.

Allen: Law in the Making.

Gray: Nature and Sources of Law.

Holland: Jurisprudence.

Korkunov: Theory of Law.

Laski: Foundations of Sovereignty and other Essays.

Willoughby: Fundamental Concepts of Public Law.

Rattigan: Science of Jurisprudence.

Duguit: Law in the Modern State.

2. *Comparative Jurisprudence*:—

Miraglia: Comparative Legal Philosophy.

Fouillée: Modern French Legal Philosophy.

Dillon: The Laws and Jurisprudence of England and America.

Sherman: Roman Law in the Modern World.

Mackenzie: Studies in Roman Law with comparative views of the Laws of France, England and Scotland.

Smith: General view of European Legal History and other Essays.

Montesquieu: The Spirit of Laws.

Bryce: Studies in History and Jurisprudence—Vol. II.

Burge's Colonial Laws.

Macdonald: Islamic Jurisprudence.

A General Survey of Events, Sources, etc.—Continental Legal History Series.

Pound: Interpretation of Legal History.

3. *History of the Common Law of England:*—

Pollock: The Expansion of the Common Law.

Pollock: The Genius of the Common Law.

Carter: English Legal Institutions.

Jenks: History of English Law.

Holdsworth: History of English Law.

Pound: Readings in the History of the Common Law.

Pollock & Maitland: History of English Law.

Holmes: Common Law.

Stephen: History of the Criminal Law.

Anglo-American Essays on Legal History.

4. *History of Equity and Equity Jurisprudence:*—

Story: Equity Jurisprudence.

Maitland: Equity.

Snell: Equity.

Bretts: Leading Cases.

White & Tudor: Leading Cases.

Buckland: Equity and Roman Law.

5. *Legislation:*—

Bentham: Theory of Legislation.

Brown: Underlying Principles of Modern Legislation.

Dicey: Law and Public Opinion.
Ilbert: Legislative Methods and Forms.
Maxwell or Craies: Interpretation of Statutes.
Beal: Rules of Interpretation.

6. *One of the following*:—

(i) *Roman Law*:—

Sandars: Institutes of Justinian.
Moyle: Institutes of Justinian.
Poste: Gaius.
Sohm: Roman Law.
Muirhead: Historical Introduction to Roman Law.
Brun: Fontes Juris Romani.

N.B.—A knowledge of the Latin text is necessary.

(ii) *Continental Civil Law*:—

Brissaud: French Private Law.
Cachard: French Civil Code.
Schuster: Principles of German Civil Law.
Wang: The German Civil Code.

(iii) *Ancient Law and Custom*:—

Vinogradoff: Historical Jurisprudence.
Allen: Law in the Making.
Sadler: Relation of Custom to Law.
Maine: Ancient Law.
Early Law and Custom.
Early Institutions.
Lowie: Primitive Society.
Malinowski: Crime and custom in Primitive Society.
Kocourek & Wigmore: Sources and Ancient and Primitive Law.
Primitive and Ancient Legal Institution.
Wigmore: The Panorama of Law.

BRANCH II—CONSTITUTIONAL LAW.

1. *Constitutional Law of England*:—

Willoughby: The Fundamental Concepts of Public Law.
Amos: The English Constitution edited by Lord C. J. Hewart.
Dicey: Introduction to the Law of the Constitution.

Anson: Law and Custom of the Constitution.
Ridges: Constitutional Law of England.
Emden: Principles of British Constitutional Law.
Bicknell: Cases on the Law of the Constitution.
Forsyth: Cases and Opinions on Constitutional Law.
Thomas & Bellot: Leading Cases on Constitutional Law.
Keir and Lawson:—Cases on Constitutional Law.
Goodnow: Comparative Administrative Law.
Comer: Legislative Functions of National Administrative Authorities.
Goodnow: Cases on American Administrative Law.
Robson: Justice and Administrative Law.
Hewart (Lord, C. J.): The New Despotism.
Ghosh: Comparative Administrative Law.

2. *Indian Constitutional Law*:—

Ilbert: The Government of India.
Ilbert & Meston: The New Constitution of India.
Rangaswami Ayyangar: The Indian Constitution.
Trevelyan: Constitution and Jurisdiction of Courts of Civil Justice in British India.
Cowell: Courts and Legislative Authorities in India.
Mukherjee: Indian Constitutional Documents.
Mukherjee: Indian Constitution.
Eggar: The Laws of India and the Government of India.
The Indian Statutory Commission Report—Vol. I.
Ghosh: Comparative Administrative Law.
The Government of India Act of 1919 and Rules made thereunder.

3. *Constitutional Law of the British Dominions and other Countries*:—

Jenks: The Government of the British Empire.
Keith: Responsible Government in the Dominions.
Keith: Imperial Unity and the Dominions.
Keith: Constitutions and Governments of the Empire.
Todd: Parliamentary Government.
Brand: Union of South Africa.
Lefroy: Constitutional Law of Canada.

Moore: Commonwealth of Australia.
Brunet: The German Constitution.
Story: Commentaries on the Constitution of the U.S.A.
Evans: Leading Cases on American Constitutional Law.
Minty: Constitutional Laws of the British Empire.
Duncan Hall: The British Commonwealth of Nations.
Hurst: Great Britain and the Dominions.
Keith: The Sovereignty of the British Dominions.

4. *Public Authorities, Corporations and Officers*:—

Charter: Law relating to Public Officers.
Moore: Act of State in English Law.
Robertson: Civil Proceedings by and against the Crown.
Robinson: Public Authorities and Legal Liability.

5. *Law of Elections*:—

Rogers: Elections.
Hammond: The Indian Candidate and the Returning Officer.
Vinayaka Rao: Law and Practice of Elections.
Hammond: Reports of Indian Election Cases—1922, 1925, 1929.

6. *British India and the Indian States* (with special reference to Treaties):—

Aitchison: Treaties, Sanads and Engagements.
Lee Warner: Native States of India.
Tupper: The Indian Protectorate.
Panikkar: Relations between the Indian States and the Government of India.
Report of the Butler Committee.
The Crown and the Indian States. (P. S. King & Co.).

BRANCH III—INTERNATIONAL LAW.

1. *Public International Law*:—

Hall: International Law.
Lawrence: Principles of International Law.
Holland: International Law.
Oppenheim: International Law.
Westlake: International Law.

Smith: International Law.

Lawrence: Documents illustrative of International Law

Pitt-Cobbett: Leading Cases on International Law.

Scott: Cases on International Law.

Bentwich: Cases and Statutes on International Law.

British Year Book of International Law.

Vattel: Law of Nations.

Grotius: Law of Peace and War.

J. B. Moore: Digest of International Law.

Alvarez: International Law from the American Stand-point, 1922.

Annual Digest of International Law Cases, 1925, 1926, 1927 and 1928.

2. *Private International Law:—*

Westlake: Private International Law.

Dicey: Conflict of Laws.

Foote: Private International Jurisprudence.

Cheng: Rules of Private International Law determining capacity to contract.

Beal: Cases on the Conflict of Laws.

8 *History of International Law:—*

Walker: A History of the Law of Nations.

Phillipson: International Law and Custom of Ancient Greece and Rome.

Visvanatha: International Law in Ancient India.

Phillimore: Three Centuries of Treatise of Peace.

Garner: International Law and the World War.

Garner: Recent Developments in International Law.

Nippold: The Developments of International Law after the World War.

Richard: Progress of International Law and Arbitration.

Marvin: Evolution of World Peace.

Perris: Short History of War and Peace.

Vattel: The Law of Nations.

Grotius: The Law of War and Peace.

4. *Prize Law:—*

Barclay: Handbook of the Law and Usage of War and Prize Law.

Tiverton: Principles and Practice of Prize Law.

Loreburn: Capture at Sea.

Roscoe: English Prize Cases.

Garner: Prize Law during the World War.

Grant: British and Colonial Prize Laws.

Colombos: Law of Prize.

Hull: Digest of cases decided in British Prize Courts (1914-27).

5. *One of the following as a Special Subject:—*

(a) *Outlines of the History of Diplomacy and Diplomatic Practice:—*

Hill: A History of Diplomacy in the International Development of Europe.

Heatly: Diplomacy and the study of International Relations.

Gooch: Recent Revelations of European Diplomacy.

Satow: A Guide to Diplomatic Practice.

Warden: Origin, Nature and Progress of Establishments.

Barclay: Problems of Diplomacy.

Borchard: Diplomatic Protection of Citizens Abroad.

Diplomatic Memoirs and Correspondence of Statesmen and Ambassadors, e.g., Bismarck, Metternich, House, etc.

N.B.—A knowledge of French should be required of the student who takes this special subject.

(b) *League of Nations:—*

Woolf: International Government.

D. J. Hill: The Modern State and International Organisation.

Pollock: League of Nations.

Butler: League of Nations.

Epstein: The League of Nations—A Survey of the past ten years.

Oppenheim: The League of Nations and Its Problems.

Fachiri: The Permanent Court of International Justice, its Constitution, Procedure and Work.

Hudson: The Permanent Court of International Justice.

Morris: International Arbitration and Procedure.

Year Books of the League of Nations.

Barnes: History of the International Labour Office.

Baker: The League of Nations at work.

Wheeler-Bennet: Information on the Permanent Court of International Justice with Supplements, 1925, 1926, etc.

Rappard: International Relations as viewed from Geneva, 1925.

Official Journal of the League of Nations from 1922 onwards.

Ralston: Law and Procedure of International Tribunals.

Problems of Peace by various Writers—2 series.

(c) *International Law in the Far East:—*

Lawrence: War and Neutrality in the Far East.

Latifi: Effects of War on Property.

Washington Conference Papers: Volume III—The Pacific and the Far East.

Takahashi: International Law during the Chino-Japanese War 1890.

Lindley: The Acquisition and Government of Territories in International Law.

Piggot: Exterritoriality.

Smith & Sibley: International Law during the Russo-Japanese War.

Takahashi: International Law applied to the Russo-Japanese War.

BRANCH IV—TORTS AND CRIMES.

1. *Theory of Crimes and Punishments including Criminology:—*

Beccaria: Crime and Punishment.

Gillin: Criminology and Penology.

Sutherland: Criminology.

Parmelee: Criminology.

De Quiros: Modern Theories of Criminality.

Subrahmanya Pillai: Principles of Criminology.

2. *Law of Crimes and Criminal Procedure in India:—*

Statute Law on the subject.

3. *History of Criminal Law and Procedure in England*

Pollock & Maitland: History of English Law.

Stephen: History of the Criminal Law.

Kenny: Outlines of Criminal Law.

Holdsworth: History of English Law.

4. *Comparative Criminal Jurisprudence including Procedure:—*

Penal Codes of Germany, France and Japan.

Callender: American Courts, (Chapters on Criminal Courts).

Du Boys': History of Criminal Law in France, etc.

5. *Law of Torts and its History:—*

Clerk & Lindsel on Torts.

Street—Foundation of Legal Liability—Vols. I & III.

Holdsworth: History of English Law.

6. *Negligence and Nuisance and Libel and Slander:—*

Beven: Negligence.

Garett: Law of Nuisance.

Odgers: Libel and Slander.

BRANCH V—LAW OF OBLIGATIONS.

(*Contracts and Torts*).

1. *Law of Contracts and its History:—*

Leake on Contracts.

Pollock on Contracts.

Salmond on Contracts.

Anson on Contracts.

Street—Foundation of Legal Liability.

Holdsworth: History of English Law.

2. *Law of Torts and its History:—*

Clerk & Lindsell—Torts.

Pollock—Torts.

Salmond—Torts.

Street—Foundation of Legal Liability.

Holdsworth: History of English Law.

3. *Remedies—Specific Performance, Injunctions and Damages.*

Collett—Specific Relief.

Bannerjee—Specific Performance.

Kerr on Injunctions.

Mayne—Damages.

Snell—Principles of Equity.

Fry—Specific Performance.

4. 5. 6. *Any three of the following:—*

(a) *Negotiable Instruments:—*

Byles on Bills.

Chalmers—Negotiable Instruments.

Bhashyam & Adiga—Negotiable Instruments.

(b) *Sale of Goods and Bailments and Carriers:—*

Benjamin—Sale.

Blackburn—Sale.

Chalmers—Sale of Goods.

Beal on Bailments.

Story—Bailments.

Disney—Carriers.

Macnamara—Carriers.

Carver—Carriage by Sea.

Indian Railways Act

(c) *Agency and Partnership:—*

Story: Agency.

Bowstead on Agency.

Lindley: Partnership.

Singhal: Partnership.

(d) *Domestic Relations, Husband and Wife, Parent and Child, Master and Servant:—*

Eversley: Domestic Relations.

Guardian & Wards Act.

Smith: Master and Servant.

Workmen's Compensation Act. (English and Indian).

(e) *Negligence, Nuisance, Libel and Slander:—*

Beven: Negligence.

Garrett: Nuisance.

Gattey: Libel and Slander.

BRANCH VI—MERCANTILE LAW.

1. *Company Law*:—

The Indian Companies Act and the English Law on the subject.

Buckland: Companies Act.

Lindley on Companies.

Palmer on Companies.

2. *Any one of the following*:—

(a) *Bankruptcy*:—

The Indian Insolvency Acts.

Williams on Bankruptcy.

(b) *Patents, Copyrights, and Trade Marks*:-

Sen: Law of Monopolies in British India (Tagore Law Lectures).

Copinger: Law of Copyright.

Danile: Patents, Designs and Trade Marks.

(c) *Insurance—Life, Fire and Marine*

Chalmers: Marine Insurance.

Bunyon: Fire Insurance.

Bunyon: Life Insurance.

Arnold on Insurance.

Porter on Insurance.

3. *Banking including Negotiable Instruments*:—

Tannan: Banking Law and Practice in India.

Jacobs: Bills of Exchange.

The Indian Negotiable Instruments Act.

Grant: Banks and Banking.

4. *Sale of Goods*:—

Statute Law, English and Indian.

Benjamin on Sales.

5. *Agency and Partnership*:—

Story: Agency.

Story: Partnership.

The Sections in the Indian Contract Act with a Comparative Study of English Law on the subject.

Lindley: Partnership.

Blackwood Wright: Partner and Agent.

Bowstead: Agency.

6. *Maritime Law*:—

Scrutton: Charter Parties.

Carver: Carriage by Sea.

Marriott: Law of Collisions.

BRANCH VII—PERSONAL LAWS.

(No lists of books are necessary to indicate the scope of examination in this group which will be of a very advanced character. A knowledge of the original sources and texts of Hindu Law will be required).

BRANCH VIII—TRANSFER OF PROPERTY.

1. *Law of Transfer of Property in England and India*:—

Hood & Challis: Conveyancy Acts.

The Indian Act with a Comparative Study of English Law on the subject.

Carson: Real Property Statutes.

2. *Vendors and Purchasers and Mortgages*:—

Dart on Vendors and Purchasers.

Williams on Vendors and Purchasers.

Seaborne on Vendors and Purchasers.

Coote on Mortgages.

Ghose on Mortgages in India.

Fisher on Mortgages.

3. *Wills, Succession and Bankruptcy*:—

Jarman on Wills.

Theobald on Wills.

The Indian Acts on the subject.

Henderson: Intestate and Testamentary Succession in India.

Williams: Bankruptcy.

4. *Compulsory and Judicial Sales.*

Macnamara: Void and Judicial Sales.

Dutt: Compulsory Sales in British India.

Civil Procedure Code: Execution Sales.

The Land Acquisition Act.

5. *Law of Private Trusts*:—

Lewin: Trusts.

The Trusts Act.

Godefroi: Trusts and Trustees.

Story: Equity Jurisprudence.

6. *Public Trusts and Charities*:—

Ganapathi Ayyar: Hindu and Muhammadan Endowments.

The Acts on the subject.

BRANCH IX—REAL AND PERSONAL PROPERTY.

1. *Real Property*:—

Williams: Real Property.

Goodeve: Real Property.

Digby: History of Real Property.

Holdsworth: History of English Law.

2. *Personal Property*:—

William: Personal Property.

3. *Highways including Foreshore and Seashore*:—

Pratt: Highways.

4. *Easements*:—

The Indian Acts on the subject.

Peacock on Easements.

Gale on Easements.

Goddard: Easements.

Coulson: Law of Waters.

Gould on Waters.

Kinny on Irrigation.

5. *Land Tenures in India—Customary*:—

Baden Powell: Land Systems.

Soundararajiengar: Land Tenures.

Guha: Land Systems of Bengal and Bihar.

6. *Land Tenures in India—Statute-Law*:—

The Estates Land Act.

The Bengal Tenancy Act.

APPENDIX IX.

Syllabuses for courses of Study in Medicine

Syllabus in Inorganic Chemistry for the Pre-Registration Examination.

Candidates will be expected to understand the elements of Chemistry included in the syllabus for the Chemistry part of the Intermediate Examination, and in addition to have an elementary knowledge of the following subjects:—

The general properties of solids, liquids and gases.

The gas laws and the kinetic theory of gases.

The general properties of solutions, including osmotic pressure and the methods of measuring it, both direct and indirect.

Electrolysis and the theory of ionic dissociation, including the theory of hydrogen-ion concentration and its measurement.

The law of mass action and its application to chemical equilibriums.

Colloids, including the effect of surface on chemical actions.

Catalysis and the general conditions of catalytic actions.

Some elementary ideas on the constitution of matter, the classification of the elements; and radioactivity.

Practical Examination.

Candidates will be expected—

to be familiar with the ordinary materials and apparatus used in laboratories, and with such operations as filtration, solution, distillation, drying, precipitation, crystallisation, and extraction with immiscible solvents;

to be familiar with the use of a chemical balance and the use and calibration of graduated flasks, pipettes and burrettes;

to prepare simple inorganic substances;

to purify or to make an intelligent attempt to purify a known substance;

to perform simple quantitative exercises, such as the determination of melting points, boiling points, densities, and the determination of the amount of water in a substance or of the amount of ash left on the ignition of a substance;

to perform any easy gravimetric estimation, for example, a sulphate as $BaSo_4$, carbon dioxide by direct weighing, chloride-ion as AgCl, calcium as CaO;

to prepare and use in simple volumetric estimation standard solutions of acids, alkalis, permanganate, iodine, thiosulphate and silver nitrate;

to determine the approximate hydrogen-ion concentration of a given solution by means of indicators;

to attack with intelligence any simple chemical problem, such, for example, as the separation of two known substances and the preparation of a standard solution of a substance that cannot be weighed.

The Examiners will use their discretion as to whether or not books may be allowed for the whole or part of the practical examination.

Syllabus in Physics for Pre-Registration Examination.

The course in Physics shall include a more extended study of the subject matter included in the Intermediate Syllabus and in addition the following:—

General.—

Measurement of small intervals of length and of time; the electrically-driven tuning fork and the electrical chronograph; graphic method of registering movement.

Periodic motion; uniform circular motion; centrifugal and centripetal forces; centrifugal separators and centrifugal pumps. Moment of Inertia. Simple harmonic motion. Simple pendulum; compound pendulum; torsion and magnetic pendulums.

Properties of matter: Elasticity; Hooke's Law; effect of loading and unloading a wire. Young's modulus and co-efficient of rigidity. Molecular phenomena in liquids; osmosis and diffusion; surface tension and capillary phenomena.

Liquids in motion in rigid and elastic tubes with special reference to the human vascular system; Principle of Continuity: Torricelli's principle; Poiseuille's principle; Bernoulli's principle.

Gas laws and their explanation on the basis of the Kinetic Theory of Matter. Van der Waal's Equation; the critical constants of a gas.

The meteorological elements; temperature in shade, in the open and in Vacuo; aqueous vapour pressure; clouds and rainfall; pressure, direction and velocity of wind; periodic winds; land and sea-breezes and monsoons; instruments for measuring the meteorological elements. Weather and climate.

Heat.—

Thermometry; dilatation; change of state; calorimetry; water and air calorimeter; calorific value of fuels and their determination; bomb calori-meters.

Radiation and absorption. Newton's law of cooling. Theory of exchanges. Methods of detecting and measuring thermal radiation.

The mechanical theory of heat. First and Second Laws of Thermodynamics. The ideal heat engine. Efficiency.

Sound.—

Production and propogation of a longitudinal wave in a material medium: velocity of propogation; Newton's formula and Laplace's correction; vibrations of strings and of gas columns. Resonance. Sound producers including the Vocal chords. Sound receivers including the human ear.

Light.—

Transverse waves and their production and propogation; velocity of propogation.

The wave theory of light; Huygens principle; rectilinear propogation, reflection and refraction of light on the basis of the wave theory.

Simple interference phenomena; qualitative study of Fresnel's biprism and double-mirror. Newton's Rings.

Double refraction. Polarisation. Saccharimetry.

The eye as an optical instrument. Defects of the eye: myopia, hyper-metropia and astigmatism. Spherical and cylindrical spectacle lenses; power and numbering of lenses.

The compound microscope; spherical and chromatic aberrations and how they are eliminated; magnification; oil immersion objective.

The spectroscope: emission and absorption spectra; direct vision-spectroscope.

The photographic camera.—

Electricity.—

Electric capacity and condensers.

The Wimshurst machine.

The quadrant electrometer.

Non-polarisable electrodes.

Conductivity of electrolytes; ionisation and migration phenomena. The capillary electrometer.

Thermo-couple and thermopile.

Electro-magnetic induction; mutual and self induction; the induction coil.

Phenomena accompanying the passage of high-tension currents through rarefied gases; Cathode rays and X-rays. X-ray photography.

Syllabus in Practical Physics.

General.—

The screw-gauge, the spherometer and the vernier microscope.

The falling plate, the Fletcher's trolley or the Atwood's machine to determine '*g*' or '*n*'

Compound pendulum, torsion pendulum and magnetic pendulum.

Young's modulus by stretching; tenacity.

Surface tension: (*a*) rise in a capillary tube. (*b*) surface tension balance.

Determination and comparison of the viscosities of liquids.

Heat.—

Co-efficients of expansion.

Determination of specific and latent heats by the method of mixtures.

Specific heat by the method of cooling.

Mechanical equivalent of heat.

Thermal conductivity.

Sound.—

Sonometer; resonating columns of gases.

Light.—

Focal lengths of thin lenses and combinations of lenses.

Determination of wave length by (*a*) Newton's rings, (*b*) Diffraction grating.

Saccharimeter

Spectrometer and spectroscope.

Electricity.—

Laws of Electrolysis.

Resistance with the P. O. Box.

Comparison of E. M. F's. by the potentiometer.

The electrical calorimeter.

Conductivity of an electrolyte.

Thermo E. M. P.

Comparison of capacities.

Co-efficient of mutual induction.

BIOLOGY.

REVISED SYLLABUS FOR COURSE OF STUDY IN BIOLOGY FOR THE PRE-REGISTRATION EXAMINATION.

The examination in *Biology* shall comprise the subjects included in the following syllabus, which is intended only to indicate its general scope and character:—

A. *General Biology.*—

The distinctive properties of living and non-living matter.

The difference between animals and plants.

The nature and properties of protoplasm.

The structure of the cell; cell division and gameto-genesis.

Conjugation and fertilization.

Segmentation and formation of germ layers.

Structure and function of animal tissues.

B. Botany.

The structure, life-history, and physiology of Yeast, Bacteria, Penicillium or other mould, Spirogyra, Chara, fern.

The elements of the morphology and physiology of the Angiosperms embracing (*a*) the structure (macroscopic and microscopic) of the root, stem and leaf; (*b*) the structure of a typical flower and modifications of the type; (*c*) the inflorescence, and the principal types of branching; (*d*) the structure and development of the seeds and embryo; (*e*) the principal types of fruits; (*f*) the dispersal of seeds and fruits; (*g*) the main facts in relation to nutrition, growth and reaction to environment.

The reproduction and life-history of Angiosperms.

C. Zoology.—

The structure, life-history and physiology of Amœba, Paramæcium, Euglena, Hydra, Earthworm, Leech, Cockroach and the anatomy of Frog and Rabbit. (Only an elementary knowledge of the muscular system of the frog, and the muscular and nervous system of the rabbit will be required).

An elementary knowledge of the more important types of animal parasites, protozoan, and metazoan, such as Entamœba, Trypanosomes, Plasmodium, Liver-fluke, Tape-worm, Round-worm, etc.

The leading types of reproduction in animals. The main features of the larval history and metamorphosis of the frog, the embryonic membranes and placenta of the fœtus of the rabbit.

The chief external characters and poison apparatus of the poisonous snakes of South India.

D.—

Variation, Heredity, Natural Selection, Evolution treated in an elementary manner.

Practical Examination.

Each candidate must be prepared to examine microscopically, to dissect and to describe the specimen of parts of the animals and plants enumerated in the foregoing syllabus with the exception that for the skull of the rabbit will be substituted that of the dog.

Syllabus in Organic Chemistry.

The examination in Organic Chemistry shall comprise the following:—

The ultimate analysis of organic compounds, and estimation of carbon, hydrogen, nitrogen, sulphur, phosphorus and the halogens.

The determination of empirical, molecular, and structural formulæ, and of molecular weights of organic substances.

The constitution and most important reactions and relationships of the following groups of compounds, illustrated in each case by a reference to a few of their most important members:—

Aliphatic series.—

Paraffin. Unsaturated hydro-carbons. The different classes of alcohols and their derivatives. Halogen and nitro derivatives of the hydro-carbons. Aldehydes. Ketones. Acids. Sulphonic acids. Simple ethers. Esters. Amines. Phosphines. Arsines. Amido-acids. Amides. Nitriles. Cyanides. Urea.

Aromatic series.—

Benzene. Toluene and their simple derivatives.

Phenols with special reference to phenol, pyrocatehol, resorcinol, and hydroquinol, pyrogallol.

Benzyl alcohol, Benzaldehyde, benzoic acid, salycylic acid, gallic and tannic acids, phthalic acids, phenophthalien, Glucosides, and Alkaloids.

Practical Examination.

The detection of the following elements:—Carbon, hydrogen, nitrogen, sulphur, phosphorus and the halogens.

Preparation of chloroform and of iodoform from ethyl alcohol and preparation and hydrolysis of an ester and of an amide.

Tests for and reactions of methyl alcohol, ethyl alcohol, glucose, cane sugar, phenol salicylic acid, formates, acetates, oxalates, cyanides, tartarates, citrates, morphine, strychnine; quinine, cinchonine and urea.

The preparation of a fatty acid from a fat. The determination of the molecular weight of a fatty acid by titration.

Candidates will be required to bring to the practical examination note books containing record of their previous practical work. These note books must be certified by the teachers of the candidates as being the actual working notes made by them in the laboratory.

(Examiners will use their discretion as to whether or not the candidates may be allowed books for the whole or part of the practical examination).

PHYSIOLOGY.

Syllabus.

Muscle and Nerve.—

Use of induction apparatus—structure and properties of muscle—effects on contraction of loan and fatigue—chemical thermal, and electrical changes in muscle—conduction in nerve—Polarisation phenomena in nerve—reaction of degeneration.

Central Nervous System.—

Reflex action in 'Spinal' frog and in man. Structure and functions of the Spinal cord. Spinal mechanism of co-ordinated movements.

Structure and functions of the Brain Stem. Connections and functions of cranial nerves.

Cerebellum.

General structural arrangements of the Cerebrum and its functions. Cerebral localisation.

Autonomic nervous system.

Special senses—

Muller's law of Specific irritability of nerves.

Structure of the eye-ball. Light reflex. Mechanism of accommodation. Refraction of the eye. Common optical defects. Use of ophthalmoscope. Perimeter. Retina and its connections. Formation of retinal images. Colour vision and contrast.

Structure of auditory apparatus. Auditory sensations. Labyrinthine impressions.

Use of Laryngoscope.

Cutaneous sensations. Gustatory and olfactory sensibility.

Digestion.—

Secretion and properties of the digestive juices and bile.

Movements of the stomach and intestines.

Absorption of foodstuffs.

Metabolism.—

Metabolism of proteins, fats and carbohydrates. Glycosuria. Estimation of Metabolism. Nitrogen, balance. Influence of work and starvation on Metabolism. Normal Diet.

Temperature of man and its regulation.

Blood.—

Red and white blood corpuscles, their origin, life history and functions. Haemoglobin and its derivatives, Haemolysis. Coagulation. Reaction of blood. Estimation of volume of blood, corpuscles and Haemoglobin.

Circulation.—

Physiological anatomy of the Heart, and action of valves. The mechanism of heart pump. Causation of heart beat. Properties of cardiac muscle. Factors influencing the activity of cardiac muscle. Output of heart. The nervous regulation of the Heart. Heart reflexes.

Blood pressure. Velocity of blood. Pulse. Capillary circulation. Vasomotor mechanism. Chemical regulation of blood-flow. Influence of exercise on circulation.

Lymph and its formation. Lymphagogues.

Respiration.—

Mechanics of Respiratory movements. Chemistry of respiration. Regulation of respiration. Effect of changes in the air breathed. Estimation of total respiratory exchange and of composition of expired and alveolar air.

Excretion.—

Urine, its composition and characters, Secretion of Urine.

Physiology of Micturition.

Skin and skin glands. Their structure and functions.

Ductless glands.—

The Physiology of reproduction.

Secretion and properties of Milk.

HISTOLOGY.

Preparation of specimens of normal tissues, either fresh or previously prepared, so as to demonstrate their minute structure.

Application of the commoner histological methods.

Recognition and description with diagrams, of microscopic preparations of any normal tissue.

PRACTICAL PHYSIOLOGY.

The methods employed for the demonstration of fundamental physiological processes and performing simple experiments.

Theory: Biochemistry Syllabus.

I. The Chemistry of Food, (*a*) Inorganic,

(b) Organic Chemistry of Proteins, fats and Carbohydrates,

(c) Vitamins.

II. The Chemistry of Digestion and absorption in Man

III. Metabolism—General and special.

IV. The Chemistry of Respiration and acidosis.

V. The Chemistry of Blood and Lymph.

VI. The Chemistry of Urine and faeces.

Practical.—

Properties and Re-actions of (a) Carbohydrates:—Glucose, Levulose, Maltose, Lactose, Canesugar, Starch, Glycogen and Dextrins.

(b) Fats—oilve oil, oleic acid and Palmitic acid, glycerol and cholesterol.

(c) Proteins—Albumin and Globulin, Metaproteins—Proteoses—Peptones, amino acids and mucin, gelatin, and casein.

Estimation of Carbohydrates, glucose, Levulose. Maltose, Lactose.

Estimation of amino-acids.

Properties of Digestive Enzymes—Biles—analysis of Gastric contents.

Qualitative tests and properties of Blood and urine.

Quantitative Estimation of chlorides, urea, Sugar, Non-Protein-Nitrogen, createnine and uric acid in Blood, and chlorides, sulphates, Phosphates, urea, sugar, createnine, Ammonia acidity and uric acid in urine.

Estimation of alveolar carbon-di-oxide by Fredericia's method.

SYLLABUS IN PHARMACOLOGY.

The course in Pharmacology consists of lectures, demonstrations in experimental pharmacology and practical pharmacy, the

aim being to impart a general knowledge of the mode of action of drugs treated from an experimental point of view.

The lectures are devoted chiefly to the discussion of the effect of drugs and poisons on the tissues of man and animals and how these effects may be utilised to relieve or cure disease. The total number of lectures should not be less than 35. The general scheme of the lectures is as follows:—

The mode of action of drugs treated from an experimental stand-point.

Pharmacology of the Central Nervous System:—

Alcohol; General anaesthetics; Hypnotics of the methane series; Bromides; Opium and Cannabis indica.

The Caffeine group: Camphor; strychnine.

Peripheral Nervous action.—Curare group; nicotine group; Belladonna group; pilocarpine group. Aconite and Veratrine.

Local Anaesthetics:—Cocaine and its substitutes; Hydrocyanic acid.

Pharmacology of the Genito-urinary system.—

Diuretics and urinary antiseptics.

Ergot; Hydrastis.

Gland Secretions.—

Adrenalin; Pituitary extract; Thyroid extract; Parathyroids and Insulin.

Pharmacology of the Circulation.—

Digitalis group.

Pharmacology of the Vessels.—

Vaso-constrictors and Vaso-dilators.

Pharmacology of respiration.—

Stimulants; Depressants; Anti-spasmodics; Expectorants; Saponins; Ipecacuanha; Respiratory disinfectants.

Pharmacology of the Alimentary Canal.—

Bitters; Volatile oils; Purgatives; Astringents; Emetics; Anthelminitics.

Pharmacology of Temperature regulation.—

Anti-pyretics; Salicylates.

Drugs acting on the excretion of Uric Acid.—

Colchicum; Atophan.

Skin irritants and *Counter-irritation.*

Antiseptics and *disinfectants.*

Drugs acting on metabolism.—

Phosphorus.

Specific Therapy.—

Cinchona alkaloids; Mercury; Arsenic; Bismuth; and Antimony.

Ion-action and *Salt action.*

Certain Positive ions.

Hydrates and Carbonates of the Alkalies. Soap.

Certain Negative ions. Acids.

General action of heavy metals.—

Iron; Silver; Zinc; Copper; Lead; Aluminium; Manganese; Chromium: Gold. Radio-active metals.

Ferments. Sweetening agents; Demulcents and Emollients.

Vitamines.

Prescription writing; Incompatibility; Synergism; Antagonism.

The physical and chemical properties of the drugs are considered only in so far as they concern their action and the methods of administration. A selection of the more important pharmaceutical preparations is also considered.

Demonstrations in Experimental Pharmacology are used to illustrate the lectures as far as practicable.

Practical Pharmacy: the course to be not less than 20 meetings.

MENTAL DISEASES.

The course of Mental Diseases shall comprise instruction in the following types of Disorder:—

(i) Failure of Mental Development—

Idiocy; Imbecility; Weak-mindedness.

(ii) Mania-Depressive Insanity—

Mania; Melancholia; Stupor; Alternating and Circular conditions.

(iii) Delusional Insanity and Paranoia.

(iv) Dementia—

Primary or Adolescent (D. Præcox); Consecutive or Termin; Organic; Para-Syphilitic (G.P.I.); Senile.

(v) Insanity due to drugs—

Alcohol; Indian Hemp; Opium and its derivatives; Cocaine; Lead.

(vi) Epileptic Insanity.

(vii) Hysteria and Psychasthenia.

(viii) Exhaustion Psychoses—

Post Febrile Insanity; Acute Delirium; Neurasthenia.

(ix) Epochal Insanities—

Insanity of Puberty and Adolescence; Insanity of the child bearing period; Insanity of Climacteric; Insanity of old age.

(x) Mental Disorder, associated with Physical diseases—

Diseases of the Thyroid Gland; Polioencephalitis; Syphilis; Tubercle, Nephritis, Diabetes and Gout.

(xi) The Medico-Legal and Social relationships of Insanity.

(xii) General Treatment.

APPENDIX X

B. S. Sc. DEGREE EXAMINATION

ENTOMOLOGY AND PARASITOLOGY

Entomology.—The Structure and Life-history of insects with special reference to the Diptera.

The structure, life-history, habits, classification and relation to disease of:—

(i) The Blood sucking Nematocera and Brachycera, especially, Culicoides, Phlebotomus, Simulium, Culex, Anopheles, Stegomyia, the Leptidae and Tabanidae.

(ii) The Muscidae, Acalypterae, and Calypterae, especially, Musca, Stomoxys, Glossina, Hippobosca, and their allies, Sarcophaga.

(iii) The House fly and other diptera which frequent human dwellings.

(iv) The myasis—producing flies of man and animals.

(v) Siphonaptera, Rhyncota, Siphunculina, and Mallophaga.

(vi) Spiders, ticks and mites.

The poison apparatus of snakes and other venomous animals.

ENTOMOLOGICAL SURVEYS AND INSECT CONTROL

Protozoology.—An introduction to the Protozoa, Sarcodina, Ciliata, Flagellata, Sporozoa; their relation to disease. Malaria surveys.

Helminthology.—The structure, life-history and classification of Nematodes, Cestodes, Trematodes and Hirudinea. The control of helminth infection.

The course shall consist of lectures and practical work in the laboratory and in the field on the collection and preservation of insects, worms and protozoa; detailed study of the more important insects and worms by means of dissections and other preparations; the breeding of mosquitoes, flies and other insects; entomological surveys and the identification of insects; the detection and identification of the commoner parasites and ova in the blood, urine, faeces of man and animals; demonstrations of macroscopic and microscopic preparations.

BACTERIOLOGY

The course of lectures shall include the classification, characters and life-history of the pathogenic and the commoner non-pathogenic microbes, fungi and yeasts, more especially those concerned with the causation and spread of endemic and epidemic

diseases and of diseases of animals transmissible to man; the bacteriology of air, water, soil, and food; disinfectants, their standardisation and use; immunology and serology; and bacterial vaccines and their use in the diagnosis, prevention and treatment of infectious disease as well as in the identification and classification of bacteria.

The course of laboratory work shall comprise practical training in general laboratory technique, sterilisation, preparation of media, the study in detail of the commoner microbes by ærobic and anærobic and other methods, the separation of pure cultures and identification, general and special microscopical and cultural methods used in the bacteriological examination of air, water, soil, sewage and sewage effluents, foods, special attention being paid to the routine methods employed in the diagnosis and prevention of disease, the standardisation of disinfectants and estimating the comparative value of disinfectant processes by their lethal action on microbes, the preparation of bacterial vaccines, the application of serological tests.

Demonstrations of special methods and processes and tests which cannot be conveniently carried out by the class shall be given from time to time.

Climatology and Meteorology

The elements of climatology as applied to Public Health. Air pressure and its influence on health; barometers, corrections for barometers. Temperature, thermometers and their uses, methods of making observations, maximum and minimum thermometers, solar and terrestrial radiation thermometers, soil thermometer, thermographs, the influence of temperature on health and ventilation. Humidity, hygrometers, direct and indirect, determination of humidity, the influence of humidity on health and ventilation. Rainfall, rainguages, the influence of the configuration of a region on the rainfall, the influence of rainfall on health. Winds, estimation of direction and velocity and pressure, determination of the direction and strength of air currents, prevailing winds, monsoons, cyclone and anticyclone systems, weather charts and weather forecasts. Atmospheric electricity, thunderstorms.

Special consideration of the meteorological conditions prevailing in the Presidency and in India generally, and their influence on the prevalence and spread of certain epidemic and infectious diseases.

Physics and Chemistry in relation to Public Health

The General principles of Physics as applied in Public Health in heating, cooling, lighting, ventilation, drainage, and filtration. The general principles of Inorganic, Organic, and Physical Chemistry in relation to the methods and processes in common use in Public Health.

The character and composition of air, water, soil, sewage, their impurities and the methods of detection.

The character, composition and adulteration of the more commonly used foods, condiments and beverages.

The characters and composition of the important disinfectants and antiseptics, their modes of action and standardisation. Methods of analysis commonly used in Public Health work, interpretation of results in the framing of opinions and reports.

Laboratory work as shown below:

Water.—Sampling, physical examination, qualitative tests, quantitative determination of the total solid residue, dissolved gases, carbonates, chlorides, sulphates, Nitrites, Nitrates, Organic matter in terms of "Albuminoid Ammonia", organic Carbon and Nitrogen and as Oxygen absorbed, Ammonia, Phosphates, Lime, Magnesia, Hardness, Poisonous metals. Microscopic examination of the deposit.

Sewage.—Chemical and Physical examination of sewage and effluents after treatment.

Air.—Quantitative estimation of Carbon dioxide, detection of Sulphuretted hydrogen, Nitrous acid and Nitric acid.

Soil.—Determination of size of grain, determination of sand and clay, determination of water capacity, porosity and permeability, determination of Ammonia and Organic Nitrogen in the soil, and of Carbonic acid in the ground air.

Food.—Qualitative and quantitative chemical examination of milk, condensed and preserved milk powders, curds, butter-milk, butter, ghee and other animal fats, edible vegetable oils, cheese, confections and honey preserves, wheat flour and other cereal flours, bread, starch, tea, coffee, cocoa, vinegar, lime-juice, ærated waters, alcoholic drinks, tinned and preserved foods, the detection and estimation of the common adulterants in the above. Detection and estimation of antiseptics, preservatives, colouring matters, poisonous and deleterious substances in food.

Disinfectants.—The chemical examination of the more important disinfectants, more especially the estimation of Chlorine in Bleaching powder and chlorine solutions, formaldehyde, phenol, Demonstrations of special methods and processes and tests which cannot be conveniently performed by the class will be given from time to time.

THE PRINCIPLES AND PRACTICE OF PUBLIC HEALTH

The Administration of Public Health, the practice in India and more particularly in this Presidency compared with that in England and Scotland, the United States, and European Countries. The Local Self-Government Department, and the Minister of Health. The Director of Public Health and his staff. The Public Health Commissioner and the Surgeon-General in their

relations with the Public Health Department. The Local Authorities, District Boards, Taluk Boards, Union Boards. The Municipalities. The Health Officer, District and Municipal and the City of Madras. The Collector, the Village Munsiff. The Village Panchayat and the Village. The Health Staff in Municipalities and Rural Areas. Other Bodies, Organisations and Officials with whom the Health Officer may have dealings. The law in relation to Public Health. The English Public Health Acts and the Rules and Regulations framed thereunder. The laws in force in the Presidency together with the Rules and Regulations made under these, Government Orders, Departmental and other Memoranda and Codes.

Note.—Detailed instruction in Sanitary Laws and Administration as outlined above, the practical application of these Laws and the discussion of problems arising in the administration of Public Health in the Presidency, will be given in a series of Special Lectures by an Assistant Director of Public Health.

Water.—The properties of water, the quantity and supply of water, sources of water-supply, storage and delivery, impurities, the chemical examination of water, the bacteriological examination of water, the interpretation of the results of a water analysis, the law relating to water-supply.

Air and Ventilation.—The composition and physical properties of air, impurities in air, diseases produced by impurities in air, examination of air, quantity of air required for ventilation, systems of ventilation, heating and cooling, examination of the sufficiency of ventilation.

Soils, Sites and Habitations.—Geological origin of soils, soil features which influence health, conformation, exposure, vegetation, irrigation, temperature, micro-organisms, organic matter, ground air, ground water, dampness, soil pollution, examination and comparison of soils, soil in relation to special diseases; Sites and habitations, design and construction, housing problems; Civic surveys and town planning; Schools, hospitals, other public buildings, markets, slaughter-houses, cowsheds, bakeries, grain stores; Hotels, hostels, tenement and lodging houses, labourers' dwellings, construction camps, temporary dwellings such as pilgrim camps, evacuation camps, inspection of sites and dwellings and other buildings.

Conservancy and Sewage.—Collection, removal, and disposal of town and house refuse, conservancy systems, latrines, urinals, collection, removal, and disposal of night soil, appliances, conservancy depots, collection, removal and disposal of sullage, the removal of sewage by water carriage, appliances and fittings, drains and sewers, ventilation, inspection and maintenance, disposal of sewage, purification of sewage, examination of sewage,

disposal of trade, effluents after treatment, the law relating to conservancy and sewage.

Note.—Detailed instruction in (1) water supply and distribution, (ii) Air supply, ventilation, cooling and heating, (iii) sites, environment, construction of buildings, and sanitary fittings, (iv) the collection, treatment, and disposal of sewage and other refuse, (v) Nature, strength and fitness of structural materials employed in sanitary works, (vi) Design of municipal, domestic, and other special sanitary works, (vii) mensuration and drawing in relation to elementary building construction and the construction and use of scales and plotting of land surveys and sections, will be given by the Lecturer, Sanitary Engineering, in a special course of lectures.

Food.—Classification of foodstuffs, nutritive functions and nutritive value of foodstuffs, quantity of food required, dietaries and their construction, diseases connected with food. Meat, fish, eggs, milk, butter, and other animal and vegetable fats, grains and cereals, vegetables and fruit, sugar, bread, cheese, concentrated, prepared and preserved foods, the inspection and examination of foods and foodstuffs, beverages and condiments, the law relating to foods and the prevention of adulteration.

Industrial Hygiene.—Offensive and dangerous trades and the result in nuisances and methods of control, industries and factories, industrial areas and factory sites, smoke and dust nuisance, industrial poisoning, disabilities and diseases due to industries and trades, the law relating to factories and dangerous and offensive trades.

Epidemiology and Infectious Diseases.—The nature and origin of infectious diseases, immunity and protection, causes and modes of spread of epidemics and epizootics, contagious diseases and diseases arising from insanitary conditions, the study of the more common infections and epidemic diseases, *e.g.*, cholera, small-pox, plague, relapsing fever, typhus fever, beri-beri, chicken-pox, diarrhœa and dysentry, enteric fevers, hydrophobia, influenza, kala-azar, leprosy, malaria, malta fever, measles, cerebro-spinal fever, dengue, pneumonia, tuberculosis, tetanus, yellow fever, and certain diseases of animals which may be transmissible to men, *e.g.*, anthrax, foot and mouth disease, glanders, rabies, trypanosome infections; puerperal pyæmia. The prevention of infectious disease. The law in relation to infectious disease.

Note.—A special course of lectures on the natural history of the common epidemic diseases of India and more especially of South India, and on the practical applications of the above principles to the control of infectious diseases in the Presidency, will be delivered by an Assistant Director of Public Health. Another

course of lectures on the diseases of animals, etc., will be delivered by a Veterinary Officer.

Medical Inspection of School Children and School Hygiene.—The principles and methods employed, control of epidemic diseases in schools, school buildings, class rooms, seats and desks, common rooms, staircases, tiffin rooms, hostels, playgrounds, ventilation, and lighting, heating and cooling, water-supply and sanitary conveniences, sites and locations.

Note.—Practical demonstrations of the above principles will be given by the Medical Officer of Health during his course of outdoor training.

Maternity and Child Welfare.—Infant mortality and maternal mortality, causes, and influences, maternity and child welfare schemes, child welfare centres, health visitors and midwifery services.

Note.—A special course of lectures on the conditions prevailing in the Presidency and the measures taken to meet them will be given by an Assistant Director of Public Health.

Demonstrations of the working of a maternity and child welfare schemes will be given by the Medical Officer of Health during his course of outdoor training.

Vital Statistics.—Population, census, estimates of population, registration of births, deaths, and marriages, calculation and correction of rates, causes of death, mortality and mobility rates, influence of race, age, sex, migration , occupation, housing season, climate, social and hygienic conditions, diseases on the above. Life tables, the collection and interpretation of statistical data, determination of the value of statistical data, statistical methods, frequency curves, correlation, contingency, probability.

Note.—A special course of lectures on the above principles will be delivered by an Assistant Director of Public Health.

Practical Sanitation.—Public Health surveys, village sanitation, sanitation of camps, improvised methods, management of fairs and festivals, personal hygiene, the disposal of the dead. Disinfection by heat and chemicals, disinfecting stations, disinfestation, the law relating to disinfection and burial.

Note.—A special course of lectures on the management of fairs and festivals in the Presidency will be delivered by the Assistant Director of Public Health.

Vaccination.—Shall consist of a course of special lectures, demonstrations, and practical work in the preparation, standardisation and testing of vaccine lymph, vaccination and verification of results, the law and procedure in the Presidency, vaccination returns and statistics. Small-pox in the Presidency and its control.

Tuberculosis.—Shall consist of a special course of lectures on the practical aspects of tuberculosis, dealing with its etiology, pathology, diagnosis, prophylaxis and treatment, especially directed to its clinical and preventive sides, the control of tuberculosis, tuberculosis institutions, administration and demonstrations, to be given by the Superintendent of the King Edward Memorial Tuberculosis Institute.

Venereal Diseases.—Shall consist of a special course of lectures and demonstrations on the practical aspects of the prevention of venereal disease, to be delivered by the Medical Officer in charge of the Venereal Wards of the General Hospital.

Town Planning.—Shall consist of a course of special lectures on town planning to be delivered by the Director of Town Planning.

Infectious Diseases.—Shall consist of a course of lectures, clinics, and demonstrations at the Hospitals for Infectious diseases, Madras, on the diagnosis and management of infectious diseases, and the administration of infectious diseases hospitals, to be delivered by the Superintendent of the Hospitals.

Instruction in Public Health Administration.—Will be given by the Medical Officer of Health of the City of Madras during the Spring and Vacation terms as provided for in the regulations above. It will include instructions on the relationship of the Health Officer with the local Authority and with the General Medical Practitioner, the operation of the various acts in every day practice, the routine practice of conservancy, sanitation, control of infectious diseases, inspection of foods, and dangerous and offensive trades, inspection of plans, sites, buildings, schools, insanitary areas, and all the other duties that a Health Officer may be expected to perform.

APPENDIX XI

First Examination in Engineering

PURE MATHEMATICS.

Algebra.—Elementary properties of rational integral functions; elementary tests of convergence and divergence of series-binomial, exponential and logarithmic series; partial fractions; simple properties of equations; solution of equations by graphs; approximate solution of equations by Horner's method.

Plane Trigonometry.—Practical use of logarithms; solution of triangles; heights and distances; calculation of areas; inverse notation; limits of $\frac{\sin x}{x}$ and $\frac{\tan x}{x}$ as x tends to zero; DeMoivre's theorem; use of the expansions of sin x and cos x in powers of x; sum of the sines or cosines of a series of angles in arithmetic progression; definition of hyperbolic functions.

Co-ordinate Geometry.—Simple properties of the straight line, circle, parabola, ellipse and hyperbola (in Cartesian and polar co-ordinates) and easy problems thereon.

Solid Geometry—Elements.

Mensuration.—Plane and solid.

Calculus.—Elementary standard forms and fundamental processes of differentiation and integration; simple applications of the derivative to geometry and mechanics; maxima and minima of functions of one variable; simple applications of integration to determination of areas, volumes, centre of mass, moment of inertia and centre of pressure.

APPLIED MATHEMATICS

Statics—Composition and resolution of forces; moments; couples; conditions of equilibrium of forces in a plane; centre of mass; work; friction; simple machines.

Dynamics.—Composition and resolution of velocities and accelerations; relative velocity; motion in a straight line with constant acceleration; Newton's laws of motion; principle of conservation of energy; projectiles; impact; motion in a circle; simple harmonic motion; simple and compound pendulums; moment of inertia.

Hydrostatics.—Transmission of fluid pressure; thrust of fluid on plane and curved surfaces; centre of pressure; bodies wholly or partly immersed; equilibrium of floating bodies; pressure of atmosphere; Boyle's Law; the common pump; air condenser; diving bell.

Science

CHEMISTRY.

1. Physical and chemical change. Constitution of matter. Simple and compound substances. Chemical action. Chemical nomenclature and symbols. The atomic theory. Equivalent, atomic and molecular weights. Specific and atomic heats. Calculation of weights and volumes of substances involved in chemical reactions. General properties of gases. Liquefaction. Diffusion. Solution. Dissociation. Electrolysis.

2. The chemistry of the following non-metallic elements and their more important compounds-hydrogen, oxygen, nitrogen, chlorine, bromine, iodine, fluorine, sulphur, phosphorus, arsenic, boron, carbon and silicon.

3. Chemical and physical characteristics of metals as illustrated by sodium, calcium, iron, zinc, lead, mercury, copper, silver and gold.

PHYSICS.

Heat

Temperature. Expansion of solids, liquids and gases; calorimetry. Change of state. Latent heat; the laws of evaporation; boiling. Conduction, convection, radiation. The laws of cooling. Dynamical equivalent of heat. The laws of thermodynamics with simple applications.

Light

The propagation of light; photometry. The laws of reflection and refraction. The direct reflection and refraction of small pencils at plane and spherical surfaces; passage through a lens. The telescope and microscope. The compound nature of white light; the achromatic lens. Polarization.

Electricity and Magnetism

1. Magnets. The magnetic field. Forces and couples on magnets in the magnetic field. The earth's magnetic field. Magnetic induction; the magnetic properties of iron and steel; hysteresis.

2. Electrification conductors and insulators, the electrostatic field and electrostatic induction. Condensers.

3. Primary and secondary cells: Current galvanometers. Electromotive force. Ohm's law. The heating effects of currents; fuses and incandescent lamps. Elementary phenomena of electrolysis.

4. Potential energy of circuit carrying current placed in magnetic field and derivation of forces and couples on circuit.

Application to moving coil instruments (ammeters, voltmeters, etc.).

5. Electromagnetic induction. Maxwell's law. Principles of simple dynamo machines; induction coil.

ELEMENTARY APPLIED MECHANICS.

1. Elementary statics, parallelogram, triangle, and polygon of forces. Easy applications to ordinary frames.

2. Stress and strain. Modulus of elasticity. Limit of elasticity. Ultimate strength. Factor of safety and working stress. Elementary application to riveted joints, thin cylinders.

3. Elementary study of beams: bending moment and shearing force. Sections in iron, steel, and wood.

4. Kinematics of simple machines. Velocity ratio. Mechanical advantage, efficiency.

5. Principle of work. Graphic representation. Simple applications to machines. Potential and kinetic energy.

DRAWING.

GEOMETRICAL DRAWING

(*a*) *Practical Plane Geometry.*—Elementary problems dealing with lines, traingles, quadrilaterals, circles, polygons. Methods of construction and problems relating thereto. Tangents. Inscribed and escribed figures. Proportional lines and angles. Areas of plane figures. Plane curves: parabola, ellipse and hyperbola; methods of drawing and chief properties. Cycloidal, spiral, and other common curves. Loci.

(*b*) *Practical Solid Geometry and Projection.*—Lines, points and planes. Projection of simple solids. Regular solids. Sections of solids. Development of plane and curved surfaces. Tangent planes. Interpenetration of solids. Determination of shadows. Isometric projection. Elements of perspective.

(*c*) *Graphics.*—Arithmetic. Plotting of curves from given data.

MACHINE DRAWING

Ability to copy accurately to scale and supply additional views. Drawings of simple machine parts from sketches. Some knowledge of the proportions of the more simple machine details such as bolts, nuts, corters, keys, etc.

BUILDING DRAWING

Ability to copy accurately to scale and to make drawings from sketches.

Masonry Details.—Bond in brickwork. Gauged, relieving and inverted arches; footings and ordinary foundations; uncoursed and coursed rubble, ashlar, etc., Dressings, such as window sills, window and door jambs, etc.

Timber Details.—Joints: halving, lapping, notching, etc., also as applied to wall plates, floors, ceilings, etc. Floors. Doors. Windows. Partitions. Roof frames.

Iron and Steel Details.—Sections of cast and rolled beams and simple applications; simple iron frames.

ELEMENTARY PRACTICAL SURVEYING.

Surveying with chain; compass and plane table. The level and its adjustments. Levelling and contouring.

Bachelor of Engineering (Civil Branch)

PURE AND APPLIED MATHEMATICS.

Pure Mathematics.

Calculus.—Differentiation; change of variable; approximations and small errors; theorem of mean value; evaluation of indeterminate forms; curvature; evolute, involute; tracing of well-known curves from their cartesian, and polar equations; partial differentiation; envelopes; Taylor's and Maclaurin's series.

Integration of standard forms; integration by substitution; integration by parts; simple formulæ of reduction; integral as the limit of a sum; areas, and lengths of plane curves; volumes and surfaces of solids of revolution; double and triple integrals as applied to centre of mass, moment of inertia and centre of pressure; differential equations of the first order and first degree; linear differential equations with constant co-efficients.

Applied Mathematics.

More advanced treatment, with calculus, of subjects included in the syllabus for the first examination in Engineering, and in addition an elementary treatment of the following:—

Statics.—Virtual work; stable and unstable equilibrium; the common catenary; the parabola of suspension bridges; light string on a rough curve.

Dynamics.—Displacement of a rigid body in a plane; translation and rotation; instantaneous centre.

Motion of a particle in a straight line with variable acceleration; motion in a plane curve; moment of inertia, momental ellipse, principal axes of inertia; equations of motion of a rigid

body in a plane; kinetic energy of a rigid body moving in a plane; motion of a rigid body about a fixed axis; pressure on the axis.

Hydrostatics.—Stability of floating bodies; meta-centre.

APPLIED MECHANICS.

1. *Stress, Strain and the Mechanical Properties of Materials used in Engineering*—

(*a*) Modulus of elasticity, elastic limit, ultimate strength, resilience; strain beyond the elastic limit; fatigue of metals. Complex stress. Applications of the theory of stress and strain.

(*b*) Mechanical properties of the materials of construction.

(*c*) Testing of materials.

2. *Applications of Statics to Structures*—

(*a*) Definition of a structure: simple and compound structures; perfect, imperfect and redundant frames.

(*b*) Principles of graphic statics: applications to roofs, bridges and similar structures.

(*c*) Beams: bending moment and shearing force: load diagrams: deflection: stiffness: the continuous beam.

(*d*) Strength of struts and columns.

(*e*) The arch rib and hanging chains.

(*f*) Theory of torsion: strength of shafting and other practical applications.

(*g*) Shells and thick cylinders.

3. *Hydromechanics*—

(*a*) Floating bodies: stability of floating vessels.

(*b*) Flow of air in passages and orifices.

(*c*) General principles applicable to design of dams, gates, etc.

1. *Building Materials*—

Stones of South India—Characteristics and preparation. Bricks and Tiles.—Manufacture and uses.

Lime, Cement, Sand, Mortar, Concrete and Plaster.—Sources of supply, preparation and working.

Timber.—Varieties used for building purposes: seasoning, preservation.

Metals—Iron and steel: elementary description of metallurgical processes for production: varieties and suitability for use. Other common metals, such as copper, zinc, lead, tin and their alloys.

2. *Theory and Design of Structures in*—Wood, iron, stee' masonry and earth—

(*a*) Masonry Structures—Foundations: buildings: bridges; retaining walls: tunnels.

(*b*) Structures in Iron and Steel.—Roofs: bridges: gates and shutters. Methods of preservation.

(*c*) Reinforced concrete structures.

3. *General Principles governing the Design of*—Railways, roads, harbours and other works.

HYDRAULIC ENGINEERING.

1. *Hydrostatics.*—Physical properties of water, and general theorems relating to pressure on surfaces and to floating bodies.

2. *Motion of Water.*—Stream line motion, Bernoulli's theorem. Simple flow in passage of varying dimensions. Fluid friction.

3. *Orifices and Notches.*—Flow from small orifices. Mouthpieces and large openings. Notches, weirs and anicuts. Submerged weirs and sluices. Bridge openings.

4. *Flow in pipes.*—Co-efficients, mean velocity and discharge. Losses of head along pipe lines, at bends, valves, etc. Branch mains, syphons and nozzles.

5. *Flow in Channels.*—Variation of velocity over cross section. Co-efficients, mean velocity and discharge. Limiting velocities. Sections of channels. Falls.

6. *Rivers.*—Estimation of discharge. Gauging. Discharge from catchment basins.

7. *Storage and Distribution.*—Rainfall. Supply from wells, rivers and reservoirs, for irrigation, navigation and town consumption.

8. *Irrigation works.*—Masonry works in general: description and methods of construction.

9. *Canals and Channels.*—Irrigation canals in deltaic and non-deltaic country. Supply from rivers and tanks. Capacity of canal. Limiting velocities. Alignment. Disposal of cross drainage. Height of banks. Navigable canals.

10. *Tanks.*—Isolated rain-fed tanks. Tanks in groups. Tanks supplied by rivers or streams. Capacity. Irrigating duty. Loss of water by evaporation and absorption. Construction of earthen bunds. Design and construction of surplus weirs. Tank sluices and their regulation. Repairs to bunds, and closing breaches.

11. *Water-supply of towns.*—General principles governing the design of works for water-supply and distribution in towns, including filtration, pumping, regulation and waste detection.

12. *Town Drainage and Sewage Disposal.*—General principles governing the design of works for sewage of towns and sewage disposal, including pumping stations, laying of sewers, flushing arrangements and treatment by bacteriological, chemical and other processes.

13. *Mechanical Appliances.*—General description and Methods of working of water-wheels, turbines, water lifts and pumps.

SURVEYING.

1. Ordinary surveying with chain, compass and plane table.

2. Levels: adjustment and manipulation. Contouring.

3. Theodolites and other surveying instruments: adjustment and manipulation. Traversing, tacheometry, triangulation, and problems in engineering geodesy and astronomy.

4. General operations of setting out and measuring engineering works.

BUILDING, DRAWING AND ESTIMATING.

The papers under these heads will be based on the foregoing syllabuses.

Bachelor of Engineering (Mechanical Branch)

MATHEMATICS

for Civil Branch.

APPLIED MECHANICS.

As for Civil Branch.

MECHANICAL ENGINEERING

1. *Kinematics and Pure Mechanism*—

(*a*) Definition of a machine. Machine elements and pairs. Links, chains and mechanisms.

(*b*) Constrained motion. Translation and rotation, instantaneous centres and centrodes.

(*c*) Virtual motion in mechanism. Velocity and acceleration diagrams.

(*d*) Altered mechanisms. Expansion of elements. Reduction of chains.

(*e*) Higher pairing involving plane motion. Spur wheel trains, cam trains, etc.

(*f*) Mechanisms containing non-rigid links. Belt gearing, chain and rope gearing, etc.

(*g*) Ordinary chains involving screw and spheric motion: worm gearing, universal joint, etc.

Applications of Statics and Kinetics—

(*a*) Friction of rest and motion. Friction of lubricated surfaces. Friction in mechanism and efficiency of machines.

(*b*) Intertia forces in mechanism: balancing: gyrostatic action.

(*c*) Effort and resistance: steadiness: crank effort: governors and fly-wheels.

General Machine Design—

Fastenings, bolts, nuts, keys and cotters; riveted joints and connexions generally; pipes and cylinders; shafting and journals; pedestals, wall fixings, etc.; belt and rope gearing; friction and spur gearing.

2. *Fuel, Gas Plants and Boilers*—

(*a*) Fuel—Coal, wood, petroleum, gas, petrol, alcohol, etc., physical characteristics: approximate chemical composition; heat of combustion.

(*b*) Gas Plants.—Gas producers, pressure and suction plants: arrangement and working.

(*c*) Boilers.—Draught: natural, forced, and induced. Ordinary forms of stationary, locomotive, marine, water-tube, and other types: heating surface, fire-grate area: boiler efficiency: superheaters: feed water heaters: accessories and management.

3. *Theory of Heat Engines*—

(*a*) Thermodynamical principles: Carnot's cycle: perfect heat engine: second law.

(*b*) Air Engines.—Stirling and other forms.

(*c*) Internal Combustion Engines.—Gas, oil and petrol engines: engines with fluid pistons: types and working: features of cycles. Proportioning of mixtures: efficiencies.

(*d*) Steam.—Thermodynamics of the generation, expansion, and condensation of steam: heat diagrams, etc.

(*e*) Steam Engines and turbines: with special reference to modern developments.

(*f*) Refrigerating Plant.—Theory and general arrangement of the more common types.

(*g*) Air Compressors.—Theory of pneumatic working.

Generating Plants, Accessories and Details—

(*a*) General arrangement and construction of the more important types,

(*b*) Condensers, air pumps, circulating pumps, cooling tanks, etc.

(*c*) Carburettors and systems of ignition.

(*d*) Cylinders, pistons, cross heads, guides, connecting rods, cranks, governors, fly-wheels, valves and valve gears, glands and pipes.

(*e*) Engine Testing.—Consumption of steam and fuel, gas and oil; brakes and dynamometers; indicators and indicator diagrams.

4. *Hydraulic Machinery*—

(*a*) Pumps.—Bucket and plunger: piston forms, valves: air vessels, and stand pipes; efficiency of pumps. Methods of lifting water by animal power.

(*b*) Water wheels.—Theory, design and efficiency: under-shot, overshot, breast and other forms.

(*c*) Turbines.—Theory, design and efficiency: parallel out-ward, and inward flow. Governing.

(*d*) Centrifugal pumps: chief types of simple and series pumps.

(*e*) Miscellaneous.—The pulsometer; hydraulic rams; air lift pumps; gas pump, etc.

(*f*) Hydraulic transmission of power.—Accumulators, valves and mains, cranes, lifts, etc.

5. *Workshop Practice and Machine Tools*—

(*a*) Metals.—Iron and steel: elementary description of metallurgical processes for production: varieties and suitability for use. Other common metals, such as copper, zinc, lead, tin, and their alloys.

(*b*) Cutting of metals: tool steel: shape and preparation of tools: lubrication of tools: speed of cutting and power re-quired.

(*c*) Surface plates: callipers, and gauges.

(*d*) Lathes: turret, repetition, and other lathes adapted for special purposes: screw cutting: tools and chucks.

(*e*) Machine tools; general principles of construction of chief forms.

(*f*) Methods of driving and general arrangement of machinery.

ELECTRICAL ENGINEERING

1. *Fundamental Laws, Units and Standards.*—C. G. S. and electromagnetic units of current, potential, resistance and quanti-ty, and their relation to practical electric units. Standards of current, electro-motive force, and resistance. Standard cells.

2. *Electrical Measuring Instruments.*—Moving magnet systems. Moving coil systems. Methods of damping. Galvanometers. Measurement of current, electro-motive force, resistance, capacity, and co-efficients of induction. Recording instruments, electric meters. Measurements of alternating current and power. Oscillographs.

3. *Magnetic Properties of Materials.*—Magnetic force and magnetic induction. Behaviour of iron and steel under the application of magnetic force. Hysteresis and its effects. Dissipation of energy by hysteresis. Experimental determination of magnetization cure and hysteresis loop.

4. *Secondary Batteries.*—Lead secondary cells. Physical and chemical changes during charge and discharge. Types of battery plates. Relation connecting capacity with rate of discharge. Maintenance and uses of cells.

5. *Continuous Current Machinery.*—Principles of the generator. Field system and armature. Characteristics. Armature reactions. Commutation. Regulation. Armature windings. Details of construction. Motors. Starting, reversing, and regulating appliances. Methods of testing generators and motors. Switchboards. Auxiliary machines. General arrangement of plant and installations.

6. *Alternating Current Machinery.*—Production and nature of an alternating current. Maximum and R.M.S. value of wave forms. Effect of resistance, inductance and capacity in circuit. Power and power factor. Choke coils. Transformers. Alternators and motors. Polyphase circuits.

7. *Electric Light and Power Distribution.*—Filament lamps and vapour lamps. Interior and exterior illumination. Mechanical and electrical properties of conductors and insulating materials. Cables. Systems of electric supply and distribution. Wiring of buildings for lighting and power. Fittings and switches. Testing of circuits. Faults. General principles of electric traction.

MACHINE DRAWING.

The papers under this head will be based on the foregoing syllabuses.

Bachelor of Engineering. (Electrical Branch).

MATHEMATICS.

As for Civil Branch.

APPLIED MECHANICS.

As for Civil Branch.

ELECTRICAL ENGINEERING.

1. *Electrical Machinery.—*

Theory and details of construction, predetermination of performance, testing and analysis of losses of the following:—

Continuous and alternating current generators and motors; Rotary and motor converters; Transformers.

2. *Electrical Measurements and Measuring Instruments.—*

Electrical units and standards. Elements of electro static and electro magnetic theories. Calculation of (1) Electro static capacity of systems of charged conductors (2) Magnetic field strength due to systems of currents (3) self and mutual inductance of coils. Derivation of G. G. S. Electro static and electro magnetic units and their dimensions. International units and standards. Absolute measurement of the international ampere and ohm. Standard cells. Standards of luminous flux, candle power and illumination.

Alternating current theory.—Symbolic vector methods and complex quantities and their application to practical cases, *i.e.*, poly phase circuits and alternating current net works. Harmonics and single and poly phase circuits. Eddy current. Losses in conductors. Properties of rotating fields. Simple cases of transient phenomena.

Methods of electrical measurement.—Theory and practice of modern test. Methods for the measurement of electric and magnetic quantities. Theory of galvanometers. Ballistic tests, flux meters, electro meters, continuous current and alternating current, potentiometers, standard dynamometer. Wattmeters, and electrostatic wattmeters. The Wheatstone bridge, including precision modifications. Measurements of high and low resistence. Alternating current bridge measurements of effective resistence and reactance. Detectors, including vibration galvanometers; errors at high frequencies. Frequency measurements. Oscillographs for high and low frequencies. Measurements of magnetic properties of materials. Iron loss measurements by wattmeter and bridge methods. Measurements of dielectric properties. Measurements of luminous flux candle power and illumination. Electrical methods of measuring temperature.

3. *Electric Power.—*

Generation, transmission and utilisation.

a. Generation:—Choice of site of station; the various determining factors. The choice of prime movers and the choice

and arrangement of plant generally. Economics of power generation. Switching and control of generators. Batteries and boosters. Switch gear; direct and remote control systems; regulating and protective devices. Instruments; synchronising apparatus.

b. Transmission:—Systems available for the transmission of power by continuous and alternating currents. The applicability of each to various conditions. Cables and ærial lines: laying, jointing and erection.

Economics of power transmission; determination of the most economical system for given conditions; distribution of losses, approximate calculations of drops, power factor, and conditions determining resonance; factors limiting the voltage in practice. Influence of power factor on transmission problems. Interference with communication circuits. Mechanical calculations relating to ærial lines. Systems of distribution, net work calculations. Choice of feeding points; Sectionalisation of net works; substations: necessity for, types available, functions of and arrangement of plant. Switch gear. High and low pressure and for special purposes. Protective systems. Lightening arresters and other safety devices. Localisation of faults.

c. Utilisation, excluding electric traction:—The advantages of electrical systems of transmission and utilisation of energy in industrial work. Selection of motor, continuous or alternating for given services; load equalisation. Speed control and regulation, special arrangements for heavy and variable torques. Automatic and semiautomatic systems. The production of measurement of light. Use of electric energy for illumination. Illumination required in given circumstances. Types of lamp, and fittings available; their choice and arrangement; calculation of illumination from total luminous radiation, effects of reflection and absorption: calculation of power required: relative advantages of various systems of charging for electric energy; principles and calculations involved.

MECHANICAL ENGINEERING.

(1) *Theory of Machines.*—

General dynamics of machines, rectilinear and rotational motions. Inertia forces. Balancing. Crank effort; fly wheels; cyclic speed variation. Gyrostatic action.

Lubrication; the laws of friction as affected by speed, pressure and temperature.

Friction brakes and clutches.

Absorption and transmission dynamometers.

Belt, rope and chain gearing, spur and bevil wheel gearing, epicyclic trains, worm and helical gearing.

(2) *Hydraulics.—*

(*a*) Laws of equilibrium of fluids and of their flow through orifice, mouthpieces and submerged openings, over weirs through pipes and in open channels and culverts. The action of a jet upon vanes straight or curved whether at rest or in motion. Theory of impulse and reaction turbines and centrifugal pumps. Typical examples. Governing.

(*b*) *Hydraulics in relation to Hydro Electric Engineering:* —Measurement of flow. Weirs, Orifices. Pipe intakes. Efflux from nozzles. Velocity of approach. Penstock. Flow of air in pipes. Limiting velocities in air canal. Rivers, preliminary measurements, current meters.

Reconnaissance of water power:—Power measurement. Relation of pondage and reservoirs to the valuation of power. Penstock with reservoir.

(3) *Theory of heat Engines.—*

Thermodynamical principles; Carnot's cycle, perfect heat engine, Second law. Hot Air Engines.

Internal combustion Engines:—Gas, petrol and oil engines; types of, working, and features of cycles. The Deisel engine. Efficiencies.

Steam:—Thermodynamics of the generation, expansion and condensation of steam, heat diagrams, etc. Modern types of boilers.

Steam Engines:—Theory and application of the entropy and heat charts. Economy of the steam engine. Influence of size, speed, ratio of expansion and superheated steam, Modern development.

(4) *Steam Turbines.—*

Flow of steam through orifices and nozzles. The De Laval turbine. The many stage impulse turbine. Rateau type. Zoelly type. The few stage velocity type. Curtis type. The many stage reaction turbine. Parsons type. Combined types. Consumption and proportions. Effect of high pressure, superheat and vacuum. Governing.

ELECTRICAL MACHINE DRAWING.

The paper under this head will be based on the foregoing syllabuses.

APPENDIX XII.

EXAMINATIONS FOR TITLES IN ORIENTAL LEARNING

SANSKRIT.

Courses of Study.

1932.

Compulsory Division—Śirōmaṇi (Regulation 6, *Chapter LIII)*

GENERAL PART

Preliminary Examination (6-ii)—

(*a*) Books prescribed—

1. Viśvanāthapañcānana—Muktāvali with Śabdakhaṇḍa-dinakarī
2. Mīmāṃsānyāyaprakāśa—Āpōdēva
3. Siddhāntakaumudi—Purvārdha only, omitting Taddhita

(1–3: Nirnaya Sagara Press, Bombay).

4. Jaiminīya-nyāya-mālāvistara—from the beginning of the work to the end of pāda I in Chap: III.

(*b*) Books prescribed—

1. Rig Veda—Vedic Reader, I to X hymns (both inclusive), text only by A. A. Macdonell (Oxford University Press).
2. Kaṭhōpaniṣad—text only (Anandasrama Series, Poona).
3. Gautamadharmasūtras—the first praśna-text only (Bibliotheca Sanskrita, Government Press, Mysore) or (Ānandāsrama Press, Poona).
4. Manu-smṛti—Chapter 9—text only (Gopal Narayan & Co., Bombay).

N.B.—In connection with the History of Sanskrit Language and Literature, for the Final Examination, under the General part, the attention of teachers is invited to the list of books recommended for study and consultation under the corresponding subjects, for Branch vi—B.A. (Honours) Degree Examination.

SPECIAL PART

Regulation 6-iii, *Chapter LIII*

BRANCH I—*Mimāmsā Group*,

Preliminary Examination.—

Books prescribed—

1. Taittirīya Samhitā with Sāyaṇa's Bhāṣya (Kāṇḍa I, Prapāṭhaka I).
2. Aitarēya Brāhmaṇa with Sāyaṇā's Bhāysa, the fourth Pañcikā.
3. Āpastamba's Srauta-sūtras with Rudradatta's Vṛtti—Prasnās I to V, both inclusive.
4. Yājñavalkya-smṛti with Mitākṣara (whole).

(1–4: Anandasrama Series, Poona.)

5. Bhāṭṭa-dīpikā—Purvaṣaṭka only (Bibliotheca Sanskrita, Mysore Government Press or Bibliotheca Indica, Calcutta).

Final Examination—

Books prescribed—

1. Bhāṭṭa-dīpikā—Uttaraṣaṭka only.
2. Śabara-bhāṣya, Chapter I—with Kumārila's Vartika, Chapter I—omitting Slōka-Vārtika
3. Pārthāsārathimisra's Nyāyaratnamālā

} (Chowkhamba Book Depot, Benares.)

4. Bhāṭṭārahasya—whole (Sudarsana Press, Conjeeveram).

BRANCH II—*Vēdānta*

Advaita—Preliminary Examination—

Books prescribed—

Brahmasûtras with Sankara's Bhāṣyā (Sri Vani Vilas Press, Srirangam).

Bhāmatī—Catussûtri (Nirnaya Sagara Press, Bombay).

Pañcapādika with Vivaraṇa—the first Varṇaka only (Vizianagaram Sanskrit Series, Benares).

Bṛhadāraṇyakōpaniṣad with Śankara's Bhāṣya—Chapters I to III
Chāndōgyōpaniṣad with Śankara's Bhāṣya—Adhyaya VI only
Māṇdûkyōpaniṣad with Gauḍapāda's Karikās and Śankara Bhāṣya.
Bhagavadgītā with Śankarā's Bhāṣya.

} (Sri Vani Vilas Press, Srirangam).

Advaita—Final Examination—

(*a*) Books prescribed—

Siddhānta-Bindu (the whole)-text only
Advaita-siddhi :
Pariccheda I :—
(i) From the beginning of the work up to the end of Āgamabādhōddhara, (ii) Ajñānavāda, (iii) Anirvacanīyatvavāda and
Paricchēda II :—Akhanḍārthavāda.
Laghucandrikā from the beginning of the work up to the end of Upādhi and Akhanḍārtha-vāda section.

} (Advaitamanjari Series, Srividya Press, Kumbakonam), or (Nirnaya Sagara Press, Bombay).

(*b*) Books prescribed—

Patañjali's Yōga sûtras with Bhōja-vṛtti.
Īsvarakṛṣṇa's Sānkhya kārikās with Gauḍapāda's Commentary.

} (Chowkhamba Book Depot, Benares.)

Advaita-Paribhāṣā by Dharmarājādhvarin (Venkatesvar Press, Bombay).

Yatīndramatadīpikā by Śrīnivāsācārya (Anandasrama Press, Poona).

Daśaprakaraṇas by Madhvācārya—omitting Karmanirṇaya and Viṣṇutattvanirṇaya—(text only) (Madhva Vilas Book Depōt, Kumbakonam).

Visiṣṭādvaita—Preliminary Examination—

Books prescribed—

Brahmasūtras with Śri Bhaṣya (Ananda Press, Madras).

Śrutaprakāśikā—Jijñāsādhikaraṇa (Nirnaya Sagara Press, Bombay.)

Bhagavadgīta with Rāmānuja's Bhāṣya (Ananda Press, Madras).

Bṛhadāraṇyakōpaniṣad with Raṅgarāmānuja's Bhāṣya (Chakravarti Ayyangar's Telugu Edition, Mysore).

Visiṣṭādvaita—Final Examination—

(*a*) Books prescribed—

Vēdārthasamgraha (Pandit, Benares).

Siddhitraya, by Yamunācārya (Chowkhamba Sanskrit Series, Benares).

Śatadūṣaṇī with Caṇḍamāruta—the first fifteen Vādas only (according to the Śāstramuktāvali Edition—Conjeeveram).

Nyāyasiddhāñjana—up to the end of Buddhiparicchēda or the 5th Paricchēda (Pandit, Benares).

(*b*) Books prescribed—Same as under Advaita—Final Examination.

Dvaita—Preliminary Examination—

Books prescribed—

Brahmasūtras with Madhvācārya's Bhāṣya.
Tattvaprakāśikā, by Jayatīrtha.
Gītātātparya-nirṇaya with Jayatīrtha's Tîkā.
Madhavabhāṣya on the Bṛhadāraṇyakōpaniṣad.
Madhvācārya's Anuvyākhyāna with Jayatīrtha's Nyāyasudha—*Jijnāsādhikaraṇa only.*
(Madhva Vilas Book Depôt, Kumbakonam)

Dvaita—Final Examination—

(*a*) Books prescribed—

Nyāyāmṛta (the first Paricchēda only).
Bhēdôjjīvana, by Vyāsarāya.
Nyāyāmṛtataranginī (the first Paricchēda only.)
(Madhva Vilas Book Depôt, Kumbakonam)

(*b*) Books prescribed—Same as under Advaita—Final Examination (*b*).

BRANCH III—*Nyāya Group.*

Preliminary Examination—

Books prescribed—

Kaṇāda's Vaiśēṣika sūtras.

Gautama's Sûtras with Vātsyāyana's Bhāṣya—Chapters I and II—Vizianagram Sanskrit Series (F. J. Lazarus & Co., Benares or Chowkhamba Book Depot, Benares).

Jagadis'a's Pancalaksanī and Simhavyāghrī (Chowkhamba Book Depôt, Benares).

Gadādharā's Caturdas'alakṣaṇî :

(i) From the beginning of the work up to the end of Dvitīyasvalakṣaṇa.

(ii) Kūṭaghaṭitalakṣaṇa.

(iii) Kūṭāghaṭitalakṣaṇa.

(iv) Vyadhikaraṇa-dharmāvacchinnābhāva-khaṇḍana-grantha (Chowkhamba Book Depôt, Benares).

Gadādharā's Paksatā—Sārvabhaumāntam (Chowkhamba Book Depôt, Benares.)

Gadādharā's Siddhāntalakṣaṇam—the whole (Chowkhamba Book Depôt, Benares.)

Final Examination—

Books prescribed—

Udayanācārya's Nyāyakusumāñjali (Chowkhamba Book Depôt, Benares, or Bibliotheca Indica, Calcutta).

Gadādharā's Avayava—from the beginning of the work to the end of Pratijñā.
Gadādharā's Sāmānyanirukti.
} (Chakravarti Ayyangar's Telugu Edition, Mysore.)

Gadādharā's Savyabhicārasāmānyalakṣaṇam.
Gadādharā's Satpratipakṣa-vibhājakam.
Khaṇḍadeva's Bhāṭṭarahasyam—to the end of prathamā.
} (Sudarsana Press, Conjeevaram.)

Gadādharā's Vyutpattivāda—whole (Nirnaya Sagara Press, Bombay).

Gadādharā's Avacchedakatā-nirukti (Chowkhamba Book Depôt, Benares).

BRANCH IV—*Vyákaraṇa Group.*

Preliminary Examination—

Books prescribed—

Paribhāṣēnduśēkhara.
Prauḍhamanōramā with Śabdaratna—from the beginning to the end of Strīpratyaya.
} (Chowkhamba Book Depôt, Benares).

Kāśikāvṛtti—Seventh Chapter only (Lazarus & Co., Benares).

Final Examination—

Books prescribed—

Laghuśabdendus'ekhara—to the end of Kārakaprakaraṇa (Chowkhamba Book Depôt, Benares).

Mahābhāṣyam—Navāhnikam from the beginning (Nirnaya Sagara Press, Bombay).

Vaiyākaraṇa-bhūṣaṇa-sāra—only the latter part, beginning from the Subaratha-vicāra to the end of the work (Chowkhamba Book Depôt, Benares).

Laghumañjūṣā, by Nageśa, from Dhātvarthavicāra to the end of the Kṛdarthavicāra.

BRANCH V—*Sāhitya Group.*

For Sāhitya-Sirōmani and Vidvān-Sanskrit, when offered as one of the two languages for the Vidvān Title under Regulation 3-(a) and (6) in Chapter LIII.

Preliminary Examination—

Books prescribed—

Bāṇa's Kādambari—the portion from the Mahāsvetāvṛttānta to the end of Pûrvabhāga only (Bombay Sanskrit Series).

Śrīharṣa's Naiṣadha cantos 10 and 11.

Kumārasambhava, Cantos 1 to 5 both inclusive. } (Nirnaya Sagara Press, Bombay).

Śākuntala.
Mālatīmādhava.
Mṛcchakaṭika.
Mudrārākṣasa.
} (Gopal Narayan & Co., Bombay).

Nilakaṇṭhavijaya by Nilakaṇṭha Dikṣita, Ucchvāsa III only. (Balamanorama Press, Mylapore).

Daṇḍin's Kāvyādarśa.

Siddhānta-Kaumudī—Pûrvārdha to the end of Apatyādhikāra.

Final Examination—

For Sāhitya-Śiromaṇi and Vidvān-Sanskrit, when offered as one of the languages under Regulations 3-a and 6, Chapter LIII.

Books prescribed—

Siddhānta Kaumudī—Uttarārdha omitting Uṇādi, Vaidika and Svara Prakaraṇas.

Vararuci's Prākṛta-Prakās'a (Chowkhamba Book Depôt, Benares.)

Vṛttaratnākara, Chapters 1 to 4.

Vāmana's Kāvyālankāra Sūtravṛtti.

For Sāhitya-Śiromani only, See Ch. LIII, Regulation 6, Branch V Final (b) :

Mammaṭa's Kāvyaprakāśa (Bombay Sanskrit Series).

Dhvanyālōka (Kāvyamālā Series, Bombay).

Udbhaṭa's Kāvyālānkārasāra with Pratihārendurāja's vṛtti (Nirnaya Sagara Press, Bombay).

Citramīmāṃsā (Kāvyamālā Series, Bombay).

Rasagaṅgādhara, by Jagannātha, from the beginning to the end of Rûpaka.

VIDVAN TITLE EXAMINATIONS.

For Sanskrit when offered as the subsidiary language for the Vidvān Title under Regulation 3-c, in Ch. LIII.

For the Preliminary Examination—

Kālidāsa's Kumārasambhava—Cantos I to V.

Kādambarī Samgraha Pūrvabhāga (whole), by R. V. Krishnamachariyar, Government College, Kumbakonam.

For the Final Examination—

Sākuntala by Kālidāsa (whole).

BRANCH VI

Jyotisa Group

Preliminary Examination—

1. Bhāskarācārya's Bījaganita—complete.
2. Bhāskarācārya's Lilāvatī—whole omitting Parikarmāṣṭaka, Kuṭṭaka and Pāśa.
3. Rêkhāganita by Jagannātha—Books II and III.

} To be had of Nirnaya Sāgara Press, Bombay or Punjab Sanskrit Book Depot, Lahore.

4. Trikōṇamiti—To be had of Lazarus & Co., Benares.
5. Praśnamārga—Pūrvārdha only—To be had of R. Subrahmanya Vathiyar, Kalpathi, Palghat.

Final Examination—

1. Siddānta-Śirōmaṇi (whole).
2. Sūryasiddhānta (whole).
3. Āryabhaṭīya (whole).
4. Bṛhat-Samhitā (whole).
5. Bṛhajjātaka (whole).
6. Muhūrtacintāmaṇi (whole).
7. Daivajñakāmadhenu (whole).
8. Jyōtirgaṇita by Khetkar (whole).

} To be had of Lazarus & Co., Benares or Chowkhamba Book-Depôt, Benares or Punjab Sanskrit Book Depôt, Lahore.

BRANCH VII

Āyurveda Group

Preliminary Examination—

1. Aṣṭāṅgahṛdaya-Śarīra-Nidāna-cikitsā sthānāni. (To be had of Anandāsrama Press, Poona, or of Nirnaya Sagara Press, Bombay).
2. Carakasaṃhitā—Sūtrasthāna only—Nirnaya Sagara Press, Bombay.
3. Suśruta-Saṃhitā—Sūtra and Śārira only—Nirnaya Sagara Press, Bombay.
4. Rasaratnasamuccaya—The first eleven Chapters—To be had of the Proprietor, Venkateswar Press, Bombay.
5. Pratyaksa-Śarīra—by Mahāmahopādhyāya Gananath Sen, M.A., L. M. & S., Calcutta.

Final Examination—

1. Carakasaṃhitā (whole)—omitting Sūtrasthāna.
2. Sus'rutasaṃhitā (whole)—omitting Sūtra and Sārīra.
3. Mādhavanidāna (whole)—To be had of Anandasrama Press, Poona, or the Nirnaya Sagara Press, Bombay.
4. Aṣṭāṅgahṛdaya (Kalpa and Uttara).
5. Rasaratnasamuccaya—Chap. 12 to the end.
6. Rasahṛdaya of Govindapāda—To be had of Nirnaya Sagara Press, Bombay.
7. Siddhānta Nidāna by Mahāmahopādhyāya Gaṇanath Sen, M.A., L.M. & S., Calcutta.

SANSKRIT AND MARATHI

1932

TEXT-BOOKS

Regulation 7-A—Sanskrit and Marathi as Co-ordinate languages.

For the Preliminary Examination—

Poetry—

(1) Krishna Vijaya (Purvárdha), first 15 Chapters, edited by R. D. Parádkar.

(2) Nalopakhyán by Raghunáth Pandit.

(3) Harichandrákhyan by Mukteshwar.

(4) Mrichhakatik by Parashurám Pant Godbole.

(5) Námsudhá by Wāman Pandit, edited by B. A. Bhide, B.A.

Prose—

(1) Jivit-Kartavya athavà Samsàr-Kartavya by D. N. Nàbar, B.A., LL.B.

(2) Moropantàvaril Nibandha by V. K. Chiplunkar, B.A.

N. B.—All the above books can be had from Messrs. Parachure Puranick & Co., Madhava Bagh, Bombay, or New Kitab Khana, Poona City.

For the Final Examination—

Grammar, Prosody and Poetics :—

(1) Vritta Darpana by Parashurám Pant Godbole.

(2) Arthálankár by V. V. Bhide, B.A.

(3) Marathi Bhashechi Ghatana by R. B. Joshi.

(4) Sulabhálankara by R. B. Joshi.

(5) Marathi Bhashenteel Vàkprachár ani Mhani by V. V. Bhide, B.A.

N.B.—All the above books can be had from Chitrashàlà Press, Poona (City).

Regulation 7-B—Marathi (Main) and Sanskrit (Subsidiary.)

Preliminary—

Poetry—

(1) Krishna Vijaya (Purvàrdha), first 15 Chapters, edited by R. D. Paràdkar.

(2) Venisamhár Nàtak by Parashuràm Pant Godbole.

(3) Nàmsudha by Wàman Pandit, edited by B.A. Bhide, B. A.

(4) Mukteshwar : Vana Parva, Chapters 6, 7 and 8 (pages 105—232). Nirnayasagar Edition.

Prose—

(1) Sukha ani Shanti by Modak, first 10 Chapters.

(2) Shivchhatrapati's life by Sabhàsada.

(3) Essays on Marathi Grammar by Krishna Shastri Chiplunkar.

(4) Proudha Bodha Vyàkarana by R. B. Joshi.

Final—

Grammar, Prosody and Poetics :—

(1) Alankàr Darpana by R. V. Talekar.

(2) Arthàlankar by V. V. Bhide, B.A.

(3) Marathi Bhashechi Ghatana by R. B. Joshi.

(4) Marathi Bhashenteel Vákprachár ani Mhani by V. V. Bhide, B.A.

(5) Vritta Darpana by Parashuràm Pant Godbole.

(6) Kekàvali by Moropant.

(7) Ishagunàdarsha by Dr. G. K. Garde.

(8) Nala Damayanti Akhyàn by Raghunàth Pandit.

N. B.—All the above books can be had from New Kitab Khana, Poona City, or Messrs. Parachure Puranick & Co., Madhava Bàgh, Bombay.

ORIYA

Oriya as a Co-ordinate-Language with Sanskrit

1932

For the Preliminary Examination—

Pranāyinī by Nīlakanṭha Das. Bhāgavata, by Jagannāth Das (8th Skandha Vaman carita). Rasakallōla (Cantos 13, 32, 33 & 34), by Deenakṛsna Das Mamu, by Phakirmohan Senapati. Prabandhamāla, by Madhusūdan Rao Ratnākar Campu, by Balabhadra Kavisūrya. Radhanath-granthavalee (Chilka, Durbar, Usha and Vivekī).	Trading Company, Cuttack.

For the Final Examination—

Alankār Bōdhōdáya, by V. S. Deb. Alankār Sāra, by S. Deb (only Chandaprakarana) Vyākarana Pravēsa, by Radhanath Rai. Utkal Sāhityara Etihasa, by Tarinicaran Ratho. Sāralā Carita, by Mṛtyunjaya Rath. Prabandhāvalee (pp. 1 to 154), by Syāmasundar Raja Guru.	Trading Company, Cuttack.

Oriya as the main language with Sanskrit as a Subsidiary language Regulations 2 and 3—Vidvan (b)

PRELIMINARY EXAMINATION.

***Poetry*—**

1. Rajadharma—Sāntiparva—Kṛishnasimha Mahābharata.
2. Sree Mukunda Dev, by Chintamani Mahānty.
3. Koteebrahmānda Sundaree (cantos 1—10), by Upendrabhanja.
4. Pranayini, by Nilakantha Das.
5. Rasakallola, by Deenakrishna Das.
6. Kishore Chandrananda Champu (Oriya portion only), by Baladev Kavisurya.
7. Ratnakara Champu, by Kavisurya.
8. Bhāgavata (Vāman Charita only), by Jagannath Das.

***Prose*—**

1. History of Orissa, by Kṛpasindhu Misra.
2. Sea Voyage of Orissa in the Past—Biṛupaksha Kar, B.L.
3. Bay Mahanti Panjee, by Gopalachandra Praharaj.
4. Mamu by Phakirmohan Seṉāpati.
5. Itihasaprasanga, by Chintamani Acharya.
6. Viveki, by Radhanath Roy.

***Drama*—**

1. Uttararama Charitra, by Madhusudan Rao.
2. Prakrutapranaya Natak, by Sree Rādhā Mohan Rajendra Dev.
3. Kalapahara, by Asvinikumar Ghosh.

***Grammar*—**

1. Sukhabodha Vyakarana, by Mrutyunjaya Rath.
2. Vyakarana Sopan, by Chandramohan Maharana.

3. Oriya Vyakarana, by an experienced teacher.

N.B.—All the above books can be had from the Trading Company, Cuttack, or from the Students' Stores, Berhampur (Ganjam District).

FINAL EXAMINATION

Poetry—

1. Sundarakanda—Ramayana—by K. Patnaik.
2. Moksha Dharma— Santiparva—Krushnasimha Mahabharata.
3. Adyatma Ramayan by Suryamoni Chyau Patnaik.
4. Baideheeshavilasa (1—25), cantos, by Upendra Bhanja.
5. Bidagdha Chintamoni (cantos 1—35) by Abhimanyusamanta Simhar.
6. Pravandha Purnachandra by "Yadumoni."

Grammar—

1. Vyākaraṇa Pravesh, by Radhanath Roy.
2. Oriya Vyakarana, by Madhusudan Das.

Prosody and Poetics—

1. Alankar Bodhodaya by V. S. Deb.
2. Alankar Sara by S. Deb. (Chandaprakarana).
3. Prabandhavallee (pages 1 to 154) by Syamasundar Rajaguru.

History of Language and Literature—

The following books are recommended:—

1. Sarala Charita, by Mrutyunjaya Rath.
2. Utkala Sahityara Itihasa, by Tarini Charana Rath.
3. Beams: Comparative Grammar of the Gaudian Languages.
4. Wilson: Philological lectures on Sanskrit and the Derived Languages.
5. Gray: Indo-Iranian Phonology.
6. Bhasatatwa; by Gopinath Nandu Sarma.
7. Prachina Utkal by Jagabandhu Simh.

N.B.—All the above books except Nos. 3, 4 and 5 under History of Language and Literature can be had from the Trading Company, Cuttack, or from the Students' Stores, Berhampur (Ganjam District); books No. 3, 4 and 5 can be had from the Oriental Books Supplying Agency, 15, Shukrawar Peth, Poona City.

TAMIL

1932

WHEN OFFERED AS ONE OF THE LANGUAGES MENTIONED IN REGULATION 7 (A) & (C)

For the Preliminary Examination—

Poetry :

Kambarāmāyanam, Ayōdhyākāndam
Prabhulingalīlai, stanzas 1 to 304
Nāladiyār, Porutpāl
Tiruvarangakkalambakam
Nālāyiraprabandham, Periyatirumoli, 51 to 100
Tēvāram, Panmurai, Appar, Tirunērisai, 51 to 100
} (Ripon Press, Madras).

Pattuppāttu, Maturaikkāñchī
Puranānūru, 1 to 50
Cilappadikāram, Maduraikkāndam
Cintāmani—Gunamālaiyār ilambakam
} Mahamahopadhyaya V. Swaminatha Ayyar, Tiruvettisvaranpet, Triplicane, Madras.

Tirukkural, Arattuppāl (Navalar Press, 300, Mint Street, Madras).

Palamoli, 51 to 100, by T. Chelvakesavaraya Mudaliar (T. P. Alagan, Perambur, Madras.)

Prose :

Mativānan, by V. G. Suryanarayana Sastri (V. S. Natarajan, No. 735, Kakatope Street, Madura.)

Pancatantram, by Tandavaraya Mudaliyar (C. Coomaraswami Nayudu & Sons, Madras).

Essay on Kambar, by T. Chelvakesavaraya Mudaliyar (T. P. Alagan, Perambur, Madras).

For the Final Examination—

Grammar, Prosody and Poetics :

Nannûl Viruttiyurai
Akapporuḷviḷakka-urai
} (Navalar Press, 300, Mint Street, Madras).

Purapporûḷvēnbā-mālai : Mahamahopadhyaya V. Swaminatha Ayyar.

Yāpparunkalavirutti : Longmans, Green & Co., Madras.

Dandiyalankāram : Ripon Press, Madras.

Ilakkanavilakkam, Pāttiyal : Ripon Press, Madras.

WHEN OFFERED AS ONE OF THE MAIN LANGUAGES MENTIONED IN REGULATION 7 (B)

For the Preliminary Examination—

Tiruvarangattandādi
Arunaikkalambakam
Amudāmbikai-pillaittamil
} (Ripon Press, Madras).

Kalasaichilēḍai-venbā
Cidambara-Ceyyuṭkovai
Turaisaikkovai
Villiputtūrār Bhāratam—first five parvams
Naiḍatam
Prabhulingalīlai
Cevvaiccūḍuvār Bhāgavatam—tenth Kandam
Tirukkuṛal-Aṛattuppāl Parimēlaḷagar Uṛai
} (Ripon Press, Madras).

Prose—

Tamil Varalāṛu—2 parts—by Rao Bahadur K. Srinivasa Pillai, Tanjore.

Tolkāppiya-p-poṛuḷadhikāra-ārāhchi, by M. Raghava Ayyangar, Tamil Lexicon Office, Limbdi Gardens, Royapettah, Madras.

Essay on Kambar, by T. Chelvakesavaraya Mudaliar (T.P. Alagan, Book-seller, Perambur.)

Grammar—

Nannūl Viruttiyurai
Akapporul-vilakkam
} (Ripon Press, Madras.)

Puṛapporuḷvenbā-mālai—Mahamahopadhyaya V. Swaminatha Ayyar, Tiruvettisvaranpet.

Yāpparungalakkārigai
Danḍiyalankāram
Cidambarappaṭṭiyal
} (Ripon Press, Madras)

For the Final Examination—

Poetry—

Kandapurāṇam, first two Kāṇḍams
Kambaramayaṇam, Kiskindhakanḍam and Sundara Kāṇḍam
Tiruccitrambalakkōvaiyar, Pērasiriyar Uṛai
Tirukkuṛal-poruṭpāl: Parimēḷaḷagar Uṛai
Sundaramūrtti Nāyanār Tēvāram
Tirumangaimannan Periya Tirumoli
Tiṇaimālai-nūṭraimpadu
} (Ripon Press, Madras).

Maṇimēkhalai, Kādais 1-26
Puṛanānūṛu, stanzas 1-250
Pattuppāṭṭu, Tirumurukāṭṛppādai and Maturaikkanci, Naccinarkkiniyar, Urai.
} Mahamahopadhyaya V. Swaminatha Ayyar, Tiruvettisvaranpet, Madras.

Grammar :

Tolkāppiyam. Eluttadhikāram, Naccinārkkiniyam (Ripon Press, Madras).

Do. Colladhikāram, Ilambūraṇam. Edited by C. R. Namasivaya Mudaliar (C.C.N. & Sons, Madras).

Do. Poṛuladhikāram, Naccinārkkiniyam and Pērāsiriyar Uṛai (Longmans, Green & Co., Madras.)

Yāpparungala Virutti (Longmans, Green & Co., Madras).

Māranalankāram, Porulaṇiyiyal (Madura Tamil Sangam, Madura).

Veṇbappāttiyal (Ripon Press, Madras).

History of Language and Literature—

The following books are recommended :—

Caldwell's Comparative Grammar, Introduction.

Grierson's Linguistic Survey, Volume IV.

History of the Tamil Language, by V. G. Suryanarayana Sastri.

Essay on Tamil, by T. Chelvakesavaraya Mudaliyar.

Primer of Tamil Literature, by M. S. Purnalingam Pillai.

Tamil Pulavar Caritam, by A. Kumaraswami Pulavar, Chunnakam, Jaffna.

Under Regulation 7 D.

TAMIL ALONE

For the Preliminary Examination—

Poetry :

Tiruvarangattandadi
Arunaikkalambakam
Amudambikai—pillaittamil
Kalasaichilēdai Venba
Cidambara-Ceyyutkovai
Turaisaikkovai
Villiputturar Bharatam—first five paruvams.
Naidatam
Prabhulingalilai
Cevvaiccuduvar Bhagavatam Tenth Kandam
Tirukkural—Arattuppal, Parimelalagar Urai

} (Ripon Press, Madras)

Prose :

Tamil Varalaru—2 parts—by Rao Bahadur K. Srinivasa Pillai, Tanjore.

Tolkappiya-p-poruladhikara-araycci, by M. Raghava Ayyangar, Tamil Lexicon Office, Limbdi Gardens, Royapettah, Madras.

Essay on Kambar, by T. Chelvakesavaraya Mudaliar (T. P. Alagan, Book-seller, Perambur).

Cholavamsa Charittram by T. A. Gopinatha Rao.

Grammar :

Nannul Viruttiyurai
Akapporul—Vilakkam

} Ripon Press, Madras.

Purapporulvenba Malai—Mahamahopadhyaya V. Swaminatha Ayyar, Tiruvettisvaranpet, Madras.

Yapparungalakkarigai
Dandiyalankaram
Cidambarappattiyal

} (Ripon Press, Madras.)

History of Tamil country :—

The question paper on the History of the Tamil country may be set on the information available from the set books prescribed under prose for the examination with the following as books of reference:—

- Tamil Varalaru by late Rao Bahadur K. S. Srinivasa Pillai;
- History of Tamil by G. V. Doraiswami Pillai, published by the Association Press;
- Kadaivallalar Kalam by Rao Bahadur Dr. S. Krishnaswami Ayyangar, published by the Madura Tamil Sangam;
- Karikal Cholan, published by Pandit Olaganatha Pillai of Tanjore;
- Seran Senguttuvan by Pandit M. Raghava Ayyangar.
- Pallavas, by Mr. P. T. Srinivasa Ayyangar, (2 parts).
- History of the Cholas, by Mr. Gopinatha Rao.

For the Final Examination—

Poetry :

Kandapuranam, first two Kandams.

Kambaramayanam, Sundara Kandam. Tiruccitrambalakkovaiyar, Perasiriyar Urai. Tirukkural-Porutpal : Parimelalagar Urai Sundaramurthi Nayanar Tevaram.	Ripon Press, Madras.

Tirumangaimannan Periya Tirumoli.

Tinaimalai-Nutraimpadu. Manimekalai, Kadais 1—26. Purananuru, Stanzas 1—250. Pattupattu, Tirumurukatruppadai and Maduraikkanci, Naccinarkkiniyar Urai.	Mahamahopadhyaya V. Swaminatha Ayyar, Tiruvattiswaranpet, Madras.

Prose :

Tamil Inscriptions 1 to 20. Edited and published by the University for the B.A. Degree Examination. Part II.

Grammar :

Tolkappiyam—Eluttadhikaram, Naccinarkkiniyam (Ripon Press, Madras.)

Do. Colladhikaram, Ilamburanam, Edited by C. K. Namasivaya Mudaliyar (C.C.N. & Sons, Madras).

Do. Poruladhikaram, Naccinarkkiniyam and Perasiriyar Urai (Longman's Green & Co., Madras).

Yapparungala Virutti (Longman's Green & Co., Madras.)

Maranalankaram Porulaniyiyal (Madura Tamil Sangam, Madura).

Venbappatiyal (Ripon Press, Madras).

History of Language and Literature—

The following books are recommended:—

Caldwell's Comparative Grammar, Introduction.

Grierson's Linguistic Survey, Volume IV.

History of the Tamil Language, by V. G. Suryanarayana Sastri.

Essay on Tamil, by T. Chelvakesavaraya Mudaliar.

Primer of Tamil Literature, by M. S. Purnalingam Pillai.

Tamil Pulavar Caritam, by A. Kumaraswami Pulavar, Chunnakam, Jaffna.

Tolkappiyam-Colladhikaram.

TELUGU

1932

VIDVAN.

Telugu when offered as one of the Languages under Regulations 7 (A) and 7 (C)

For the Preliminary Examination.

Poetry—

1. Bharatamu—By Nannayya—Adiparvamu—VIII Canto-verses ... 1—223
2. Manu Charitra—By Peddanna — Canto II
3. Vikramarka Charitram—By Jakkanna, published by V. Ramaswamy Sastrulu and Sons — Canto III
4. Vijayavilasamu—By Chamakuri Venkatakavi—Canto I
5. Sringara Sakuntalam—By Pillalamarri Pinaveerabhadra kavi — Canto II

Prose—

1. Karpuramanjari—By Chilakamarti Lakshminarasimham, Rajahmundry.
2. Nayapradeepamu—By Korada Ramachandra Sastry, (Korada Ramakrishnayya, O. R. Institute, Royapettah.)

Drama—

Sakuntalam—By Vedam Venkataraya Sastrulu, (V. Venkataroyar, Mallikeswarer Lane, G.T., Madras.)

Grammar—

1. Balavyakaranam—By Chinayya Suri.
2. Kavijanasrayamu—By Bheemanna.
3. Kavyadarsamu—By Avvari Subrahmanya Sastri, Kovvur, West-Godavari District.

For the Final Examination.

Poetry—

1.	Vasu Charitra	...	Canto	III
2.	Sringara Naishadhamu—By Sreenadha	...	,,	III
3.	Amukta Malyada	...	,,	II
4.	Yayati Charitra	...	,,	IV
5.	Raghava Pandaviyamu—Pingali Suranna	...	,,	II

Drama—

Vikramorvaseeyamu—By Vaddadi Subbarayudu Garu. (Rajahmundry.)

Grammar, Prosody and Poeties—

1. Proudhavyakaranamu.
2. Balavyakaranamu.
3. Andhra Sabda Chintamani.
4. Appakaviyamu—Cantos III and IV.
5. Narasabhupaleeyamu.
6. Dasarupakamu—By M. Suryanarayana Sastri—Cantos III and IV.

Vidvan.

Telugu when offered as the Main Language under Regulation 7 (B)

FOR THE PRELIMINARY EXAMINATION

Poetry—

1. Bharatamu, Santiparvamu by Tikkanna.
2. Virataparvamu by Tikkanna, 2nd canto.
3. Harivamsamu, Purvabhagam, 5th canto.
4. Uttaraharivamsamu, 1st and 2nd Asvasams.
5. Prabhavati Pradyumnamu, 1st two cantos, beginning with the story.
6. Sivarathri Mahatmyamu, 1st two cantos.
7. Ekanta Seva by Venkata Parvateesa Kavulu.

Prose—

1. Dasakumaracharitramu by T. Sanjeevarayudu, available with Vavilla Ramaswami Sastrulu & Sons, Madras.

2. Prabhatamu by Vanguri Subba Rao, Kamalakutir, Narsapur.
3. Prachina Haindava Prajasvamika Prabhutvam by Desabhatla Lakshminarasimham, Anantapur.
4. Ramayanam (Prose) by T. Tevâpperumallayya from 17th sarga to 31st sarga, (Balakandamu), (Ananda Press, Madras).

Drama—

Sri Krishna Tula Bharamu, Potukuchi Subbayya Garu, M.A., L.T., Deputy Inspector of Schools, Rajahmundry.

Grammar—

1. Balavyakaranamu.
2. Praudhavyakaranamu.
3. Lives of prescribed authors.

FOR THE FINAL EXAMINATION

Poetry.—

1. Vijayavilasamu.
2. Parijatapaharanamu.
3. Sringaranaishadhamu, 1st two cantos.
4. Amuktamalyada, 4th Asvasam.
5. Harischandra Nalôpakyanamu—Canto III.
6. Atcha Tenugu Ramayanamu—Kishkindha and Sundara Kandams.

Advanced Grammar, Prosody and Poetics—

1. Andhra Sabda Chintamani.
2. Adharvana Karikalu.
3. Appakaviyamu, 3rd canto.
4. Anantuni Chandassu, the whole except Yatiprasaprakaranamu.
5. Narasa Bhupaliyamu.
6. Andhra Dasarupakamu.
7. Alamkaropanyasamu from Andhra Vijnana Sarvasvam-Andhra Patrika Office, Madras (Volume II—Telugu Encyclopaedia.)

History of Language and Literature—

I. Bhashavangmayacharitam (Books recommended) 1. History of Andhra Literature by Mr. Vanguri Subba Rao. 2. Andhra Kavula Charitam, by Veeresalingam Pantulu, New and Old Editions. 3. Kavijeevitamulu by G. Sriramamurti. 4. Bhashotpatthi Kramamu by Ramakrishnayya.

II. Pracheenandhra Bhashasvarupam from Raja Raja Narendra Sanchika and Andhra Maha Bharata Avatarika and Telugu of Raja Raja Narendra's times (from the same book).

KANARESE.

1932.

VIDVAN TITLE EXAMINATION.

Under Regulations 7 (A) & 7 (C).

Preliminary Examination.—

(1) Pampa Bharata (Vikramarjuna Vijaya)—Chapters 1 to 4, both inclusive (Government Central Book Depot, Bangalore).

(2) Ramashwamedha by Muddana, (Kavya Kalanidhi Office, Mysore).

(3) Venisamhara Nataka by Pandit Jayarayachar (M. S. Rao & Co., Bangalore).

(4) Muddana (Secretary, Central College Karnataka Sangha, Bangalore).

Final Examination.—

Grammar, Prosody and Poetics—

(1) Kavi Charitre (with introduction), Parts 1 and 2, by R. Narasimhacharya, M.A., (Author, Malleswaram, Bangalore).

(2) Bhasha Sastra by R. Tatacharya, M.A. (M. S. Rao & Co., Bangalore).

(3) Vyakaranopanyasa Manjari by R. Raghunatha Rao. (M. S. Rao & Co., Bangalore).

(4) Apratima Vira Charite by Tirumaliengar (Kavya Kalanidhi Office, Mysore).

(5) Chhandassu by Nagavarma, (Basel Mission Book Depot, Mangalore).

(6) Sabdamanidarpana by Kēsi Raja, (Basel Mission Book Depot, Mangalore).

(7) Sringara Ratnakara by Kavi Kama.
(8) Kavisamaya by M.A. Ramanujiengar
} Kavya Kalanidhi Office, Mysore.

Under Regulation 7 (B.)

Preliminary Examination—

(1) Yasodara Charitre by Janna, (Kavya Kalanidhi Office, Mysore).

(2) Niti Manjari by R. Narasimhacharya, M.A., Part I, Stanzas 1—100. (Author, Malleswaram, Bangalore City).

(3) Samyaktva Koumudi by Mangarasa. Chapters 1, 2 and 3 (Mahavir Printing Press, Belgaum).

(4) Abhiseka Nataka by Vidvan P. Sundara Sastriar (B. M. Nath & Co., Vepery, Madras).

(5) Bhisma Charitre by C. Vasudevaiya (Author, Malleswaram, Bangalore City).

Grammar—

(1) Halagannada Vyakarana Sutragalu (B. M. Book Depot, Mangalore).

Final Examination.—

Poetry and Prose—

1. Santi Purana by Ponna, Chapters 1 to 4, both inclusive. (People's Printing and Publishing House, Triplicane, Madras).

2. Chikadevaraja Vamsavali by Tirumaliengar. (Kavya Kalanidhi Office, Mysore).

3. Dharmamrita by Nayasena—1st Aswasa. (Government Central Depot, Bangalore).

4. Sakuntala Nataka by Basappa Sastri. (M. S. Rao & Co., Bangalore).

5. Chandragupta Chakravarthi by A. Venkata Rao, B.A., L.T. (People's Printing and Publishing House, Triplicane, Madras).

Grammar, Prosody and Poetics—

1. Sabdamani Darpana by Kēsiraja.
2. Chhandassu by Nagavarma

} B. M. Book Depot, Mangalore.

3. Sringara Ratnakara by Kavi Kama.
4. Apratimavira Charite by Tirumaliengar.
5. Kavi Samaya by M. A. Ramanujiengar.

} Kavya Kalanidhi Office, Mysore.

History of Language and Literature—

1. Karnataka Kavi Charitre (with introduction) by Mr. R. Narasimhacharya, Vols. 1 and 2.
2. Bhasha Sastra by R. Tatachar, M.A., L.T.
3. Vyakaranopanyasa Manjari by R. Raghunath Rao.

MALAYALAM.

1932.

Vidvan 7 (a) and (c).

Preliminary.

Poetry—

(1) Kannassa Ramayanam—Aranyakandam—University Selections for B.A., Vol. I, Part II.

(2) Shree Parvam—Maha Bharatam—by Ezuthachan—Any Press.

(3) Kirmeera Vadham—Kathakali—Any Press.

(4) Kannuneerthulli by Nalappat Narayana Menon, Andathode, South Malabar.

(5) Sahityamanjari—Vol. III by Vallathole, Nhamanakkad, *via* Kunnamkulam—Cochin State.

Drama—

Janaki Parinayam—by C. Chathukutty Mannadiar, Mangalodayam Press, Trichur.

Prose—

Sreeniketanam—by N. Sankaran Nair, Retd. Pandit, Kollengode, South Malabar.

Final.

1. Leelathilakam—A. Krishna Pisharoty (Palace Tutor, Trivandrum).
2. Kerala Panineeyam, by A. R. Raja Raja Varma, M.A., (B. V. Book Depot, Trivandrum).
3. Bhasha Bhushanam, by A. R. Raja Raja Varma, M.A. (B. V. Book Depot, Trivandrum).
4. Vrithamanjari, by A. R. Raja Raja Varma, M.A., (B. V. Book Depot, Trivandrum).
5. Sahityacharitam, by A. Krishna Pisharoty, Palace Tutor, Trivandrum.
6. Malayala Bhashayum Sahityavum by Attur Krishna Pisharoty, (University Lectures, University of Madras.)

Vidvan 7 (b).

Preliminary.

Grammar—

Leelathilakam—by A. Krishna Pisharoty, Palace Tutor, Trivandrum.

Poetry—

(1) Nalacharitam—Kathakali, Third and Fourth day's plays. (B. V. Book Depot, Trivandrum).

(2) Krishnagatha — Rugminee Swayamvaram — Mangalodayam Press, Trichur.

(3) Chintaratnam by Ezuthachan (Any press).

(4) Unnineeli Sandesam—Uttara Sandesam—Edited by A. Krishna Pisharoty, Palace Tutor, Trivandrum.

(5) Adhyatmaramayanam—Sundarkandam—by Ezuthachan—Any Press.

Prose—

1. Keraleswaran—by T. Raman Nambissan, M.A., L. T., Palace Tutor, Trivandrum.
2. Ezuthachan—by R. Narayana Panikkar, B. A., L.T., Trivandrum.
3. Prasangatharangini Part III—P. K. Narayana Pillai, B. A., B. L.,—B. V. Book Depot, Trivandrum.

Final.

Poetry.—

1. Ramacharitam, 1 to 9 Patalams—B. V. Book Depot, Trivandrum.
2. Kuchela Vritham and Krishna Vilasam—edited by Chelnat Achyuta Menon, B. A., O. R. Institute, University of Madras.
3. Gouricharitam—Malayalam Improvement Committee, Trichur.
4. Pandavodayam—by Kochunni Thampuran—Manager, Lakshmi Bhai, Trichur.
5. Ascharya Chudamani—Kunhikuttan Thampuran—B. V. Book Depot, Trivandrum.
6. Swapnavasavadatha—by Vallathole—A. R. P. Press, Kunnamkulam, Cochin State.
7. Kalakeyavadham—Kathakali—Kottayath Thampuram—Any Press.
8. Kuchela Vritham-Vanchipattu—Any Press.

Grammar, Rhetoric, etc.

1. Kerala Panineeyam—A. R. Raja Raja Varma, M. A.—B. V. Book Depot, Trivandrum.
2. Bhasha Bhushanam—A. R. Raja Raja Varma, M. A.—B. V. Book Depot, Trivandrum.
3. Vrithamanjari—A. R. Raja Raja Varma, M. A.—B. V. Book Depot, Trivandrum
4. Mandanamanjari—by D. Padmanabhanunni, B. A., Union Christian College, Alwaye.
5. Keralasahityacharitram Vols. I and II—by R. Narayana Panikkar, B.A., L.T., Trivandrum.

6. Sahityacharitra Samgraham—by P. Sankaran Nambiar, M.A., (Saraswathi Vilasam Book Depot, Trichur.)

7. Nataka Pravesika—by A. D. Harisarma (Vaneekalebaram Press, Trichur.)

8. Bhashayum Sahityavum—by Attur Krishna Pisharoty, Palace Tutor, Trivandrum.

9. Sahitya Charitam, Part I—by Attur Krishna Pisharoty, Palace Tutor, Trivandrum.

10. Kavyasaram—by K. Parameswaran Pillai, M. A., Nantiyar Veetu, Thampanoor, Trivandrum.

Munshi-i-Fazil Title Examination

1932.

Preliminary

Mazamin-i-Sharar, Part IV—Geographical and Historical Essays.

or

Mazamin-i-Sharar, Vol. 4. Do.

Intikhabi-Mazamini—Sir Sayyid.

Musaddasi-Hali.

Kulliyathi Akbar, Part II.

Sarmay-i-Danish by Jafari.

Q'issa-Haji Baba Asfanani—1st half.

Mardi-Khasis.

Masnayi Maulana Rumi—First half Dafter.

Nukhubul Mulah, Part IV.

Final

Hayathi Jawid, Part II.

Muwazana-i- Anis-wo Dabir.

Bangi Dira by Iqbal.

Intikhabi Qasaid-i-Zauq, by Shah Sulayman.

Siyahat Nameh Ibrahim Beg, 1st Volume.

Intikhabi Siyarul Muta'akhkirin—From Baber to Shahjehan.

Payami-Mashriq, by Iqbal.

Qasa-i-di Qa'ani-Alif and Ba.

Shi'rul Ajam, Parts II and V.

Khizinatul Fawa'id, Part II.

Majani-ul Adab, Volume I.

Afzal-ul-Ulama Title Examination

1932.

Preliminary

Tafsir Muhammad Abduhu, Volume II.

Al-Mizan by Inam Sha'rani—First Part only.

Jami'ut Tirmidhi—First half.

Qasidatul Burdah.

Mu'allaqat by Imraul Qays, Tarafa and Zuhayr.

Al-Fakhari.

Usulush-Shashi.

Basayarun Nasiriyah—First half.

For those who do not offer Urdu Translation:—

Muqqaddima-i-Ibni Khaldun—First half.

Final

Tafsirul-Jawahir, Part I.

Sahi-hul-Bukhari, 1st five Ajza'.

Muqaddima-i-Ibni Salah.

Bidayathul Mujtahid by Ibni' Rushd, 1st Volume.

Nurul Anwar—Sunnath, Ijma' and Qiyas—

Maqamat-i-Hariri—First ten Maqamas.

Tarikhu Adabil Lughatil Arabhiyya, 1st Volume.

Hamasa-Babul Hamasa wal Marathi.

Diwani Mutanabhi-Alif and Ba.

Tarikhul Umamil Islamiyah (Part II only) by Al-Khizuri.

Al-Basairun Nasiriah—whole.

For those who do not offer Urdu Translation:—

Muqqaddima-Ibni-Khaldun—2nd half.

Examinations for Titles in Oriental Learning, 1933.

SANSKRIT.

1933

The same as for 1932.

SANSKRIT AND MARATHI

1933

The same as for 1932.

ORIYA

1933

The same as for 1932.

TAMIL

1933

The same as for 1932.

TELUGU.

1933.

VIDVAN

[Telugu when offered as one of the languages under 7 (A) an 7 (c)]

FOR THE PRELIMINARY EXAMINATION.

Poetry.—

1. Bharatamu—By Nannayya, Adi Parvamu, Canto V, Verses 1 to 160.
2. Bhaskara Ramayanamu, Kishkindhakandamu, Verses 1 to 175.

3. Kasi Khandamu—by Sreenada, Canto. V.

4. Kavikarna Rasayanamu—by Sankusala Narasimha Kavi, Canto II.

5. Prabhavathi Pradyumnamu—By Pingali Suranna, Canto II.

6. Yayathi Charitramu—By Ponnakanti Thelaganna, Canto III.

Prose.—

1. Rani Samyukta—Vignanachandrika Mandali Series.

Drama.—

1. Mudra Rakshasamu—By Sasurla Ananta Rao.

Grammar, Prosody and Poetics—.

1. Balavyakaranamu—By Chinnaya Suri.

2. Kavijanasryamu—By C. Bheemanna.

3. Kavyadarsamu—By Avvari Subrahmanya Sastri, Kovvur, West Godavari District.

FOR THE FINAL EXAMINATION.

Poetry.—

1. Bhagavathamu—By Bommara Pothanna, Gajendramokshana Katha Skanda VIII, Verses 1 to 137.

2. Vasu Charitra—By Ramaraja Bhushana, Canto IV.

3. Uttara Hari Vamsamu—By Nachana Somanatha, Canto II.

4. Manu Charitramu—By Alasani Peddanna, Canto IV.

5. Raghavapandaviyamu—By Pingali Suranna, Canto III.

Drama.—

1. Savitri Parinayamu—By Ketavarapu Venkata Sastri.

Grammar, Prosody and Poetics.—

1. Andhrasabdachintamani—By Nannayya.

2. Proudavyakaranamu—By B. Seetharamacharlu.

3. Appakavyamu, Cantos III and IV.

4. Narasabhupaliyamu.

5. Dasarupakamu—By M. Suryanarayana Sastri, Cantos III and IV.

VIDVAN (1933).

Prose.—

[Telugu when offered as the main language under Regulation 7 (b)]

FOR THE PRELIMINARY EXAMINATION.

Poetry—

1. Bharathamu, Anusasanika Parvamu, Canto I, Verses 168 to 272.
2. Harivamsamu—By Yerrapragada—Uttarabhagamu, Canto I.
3. Bheemakhandamu—By Sreenada, Canto III.
4. Rajasekharavilasamu—By M. Mallana, Canto III.
5. Kalapurnodayamu—By Pingala Suranna, Cantos I to IV.
6. Neelasundari Perinayamu by Timmakavi.
7. Harischandranalopakhayanamu—By Ramarajabhushana, Canto III.

Prose.—

1. Lakshmanaraya Vyasavali—Vignanachandrika Mandali Series.
2. Dasavatara Charitramu—By Janamanchi Subrahmanya Sarma.

Drama.—

1. Vishada Sarangadhara—by D. Krishnamacharlu of Bellary.

Grammar, Prosody and Poetics—

1. Balavyakaranamu.
2. Proudhavyakaranamu.
3. Tatsamachandrika.
4. Kavyalankarachudamani—By Vinnakola Peddanna.

(The lives of the authors of the books prescribed to be studied).

FOR FINAL EXAMINATION.

Poetry.—

1. Amuktamalyada—By Krishnadevaraya, Canto II.
2. Vasucharitramu—by Ramarajabhushana, Canto IV.
3. Panduranga Mahatmyamu, Canto I.
4. Jayamini Bharatamu—by Pillalamarri Pinaveerabhadrudu, Canto IV.
5. Harivilasamu by Sreenadha, Canto III.

Dwipada.—

1. Harischandropakhyanamu—By Gourana Manthri. 1st 500 lines.

Advanced Grammar, Prosody and Poetics.—

1. Andhrasabdachintamani.
2. Atharvanakarikavali.
3. Appakaviyamu (except Cantos II and V).
4. Narasabhupaliyamu.
5. Kavyadarsamu—By Avvari Subrahmanya Sastri.
6. Dasarupakamu—By M. Suryanarayana Sastri, Cantos III and IV.

History of Language and Literature.—

Books Recommended.—

1. History of Andhra Literature—by V. Subbu Rau.
2. Kavithva Thatwa Vicharamu—by C. Ramalinga Reddi.
3. Sahitya Mimamsa—by Kameswara Rao.
4. Lives of Telugu Poets—by Veerasalingam Pantulu.
5. Prachina Andhra Bhasha Swarupamu from Rajaraja Narendra Sanchika.
6. Bhashotpattikramamu—By K. Ramakrishnayya.

KANARESE

1933

VIDVAN

Under Regulations 7 (A) & (C).

***Preliminary*—**

Poetry and Prose—

1. Vikramarjuna Vijaya by Pampa (Academy edition), Chapters 6 and 7. 2. Rajasekhara Vilasa by Shadaksara Deva, Chapters 1 and 2. 3. Jagannatha Vijaya by Rudra Bhatta, Chapters 1, 2 and 3. 4. Indra Kila Vijaya Nataka by M. Sitarama Sastri.	Vishwakarnataka Publishing House, Chikpet, Bangalore.

5. Shanti Purana by Ponna, Chapters 7 and 8 (People's Printing and Publishing House, Triplicane, Madras.)

6. Chikadeva Raja Vamsavali by Tirumalarya. (Karnataka Kavya Kalanidhi Office, Mysore).
7. Mudra Manjusha by Kempu Narayana (Wesleyan Mission Press, Mysore).

Final—

Grammar, Prosody, Rhetoric, etc.—

1. Sabdamani Darpana by Kesiraja (B. M. Book Depot, Mangalore.)

2. Karnataka Vyakaranopanyasa Manjari by R. Raghunatha Rao. 3. Karnataka Chandraloka by Lakshmi Narasimha Sastri. 4. Muddana. 5. Ranna Kavi Prasasthi.	Vishwakarnataka Publishing House, Chikpet, Bangalore.
6. Sringara Ratnakara by Kavi Kama. 7. Chhandassu by Nagavarma.	Karnakata Kavya Kalanidhi Office, Mysore.

8. Karnataka Kavi Charitre, Vols. 1, 2 and 3, by Rao Bahadur R. Narasimhachar (Author, Malleshwaram, Bangalore).

VIDVAN

Under Regulation 7-B.

Preliminary—

Poetry and Prose—

1. Srirama Pattabhisheka by Mahalaxmi. 2. Yashodhara Charitre by Janna. 3. Uttara Rama Charitra Natakada Kathe. 4. Chikadeva Raja Vijaya by Tirumalarya, Chapters 1, 2, and 3.	Karnataka Kavya Kalanidhi Office, Mysore.
5. Damayanti Swayamvara by Basappa Sastri. 6. Chamundaraya Purana by Chamundaraya, Part I. 7. Vikramorvasiya Nataka by S. Aiya Sastri.	Vishwakarnataka Publishing House, Chikpet, Bangalore.

Grammar—

Sabdamani Darpana by Kesiraja (B. M. Book Depot, Mangalore.)

Final—

Poetry and Prose—

1. Ajita Purana by Ranna—Chapters 1, 2 and 3. 2. Neminatha Purana by Nemichandra, Chapters 1, 2 and 3. 3. Mitravinda Govinda Nataka by Singararya. 4. Ramaswamedha by Muddana.	Karnataka Kavya Kalanidhi Office, Mysore.

5. Sabarasankara Vilasa by Sadakshara Deva. 6. Jagannatha Vijaya by Rudra Bhatta, Chapters 4, 5 and 6. 7. Bhishma Nataka by D. K. Bharadwaj.	Vishwakarnataka Publishing House, Chickpet, Bangalore.

Grammar, Prosody, Rhetoric, etc —

1. Sabdanusasana by Bhattakalanka (omitting commentary) 2. Kavyavalokana by Nagavarma (omitting Sabda Smriti.)	Government Central Depot, Bangalore.
3. Apratimavira Charitre by Tirumalarya. 4. Sringara Ratnakara by Kavikama. 5. Chhandombudhi by Nagavarma.	Karnataka Kavya Kalanidhi Office, Mysore.

6. Karnataka Kavi Charitre by R. Narasimhachar, M.A., Vols. 1, 2 and 3.

7. Karnataka Vyakaranopanyasa Manjari by R. Raghunatha Rao. 8. Muddana. 9. Ranna Kavi Prasasthi.	Vishwakarnataka Publishing House, Chickpet, Bangalore.

MALAYALAM

1933

FOR VIDVAN TITLE EXAMINATION.

Under Regulations 7 (A) and (C).

Preliminary:—

1. Kannassa Ramayanam—Balakandam—edition by Nantyār Veetil K. Paramesvaran Pillai, M.A., Trivandrum.

2. Bheeshma Parvam—Bharatam—Ezhuthachan—Any Press.

3. Dakshayāgam—Kathakali by Irayimman Thampi—Any Press.

4. Prarōdanam by Kumaran Asan—To be had of Mrs. Asan, Thonnakkal, near Trivandrum.

5. Sahityamanjari, Part V by Vallathole Narayana Menon, Nhamanakad, *via* Kunnamkulam, Cochin State.

Drama:—

1. Malayalasakuntalam by A. R. Raja Raja Varma, M.A., (B. V. Book Depot, Trivandrum.)

2. Uthararama Charitam by C. Chathukutti Mannadiar. (Mangalodayam Press, Trichur.)

Prose:—

Kerala Chakravarthi Udayamarthandam by G. R. Venkatavarada Ayyangar, (A. R. V. Press, Fort, Trivandrum.)

Final:—

Same as for 1932 with the following additions:—

1. Dravida Vrithangal, etc., by Appan Thampuran, Ayyanthole Palace, Trichur.

2. Kavyasāram by Nantyār Veetil K. Paramesvaran Pillai, M.A., Trivandrum.

3. Mandanamanjari by D. Padmanabhanunni, M.A., Union Christian College, Alwaye.

Under Regulation 7 (B).

Preliminary:—

1. Leelathilakam edited by Attur Krishna Pisharoty, Palace Tutor, Trivandrum.

2. Vyakarana Mithram by M. Seshagiri Prabhu, M.A., (Basel Mission Book Depot, Mangalore, S. K.)

Drama:—

Prabhodachandrodayam by N. Kumaran Asan, (to be had of Mrs. Asan, Thonnakkal near Trivandrum or V. V. Press, Quilon.)

Poetry:—

1. Vatsastheyam—Krishnagatha—University edition.

2. Bhagavatham—Ekadasa Skandham by Ezhuvath Nanukutty Menon, Edition by K. Y. Nanukutty Menon, containing the commentary of Vodavanoor Korathē Narayana Menon, Thathamangalam, Cochin State.

3. Unnuneeli Sandesam by Attur Krishna Pisharoty, Palace Tutor, Trivandrum.

4. Krimmeera Vadham—Kathakali—Kottayath Thampuran, edition by P. Krishnan Nair, Siromani, University Research Institute, Limbdi Gardens, Royapettah.

Prose:—

1. Keraleswaran by T. Raman Nambessan, M.A., L.T., Head Master, English High School, Parur.

2. Ezhuthachan by P. K. Narayana Pillai,, B.A., B.L., Trivandrum, (Ramachandravilasam Press, Quilon).

3. Vijnāna Deepika, Part I, by Ulloor S. Paramesvara Ayyar, M.A., B.L., Trivandrum.

Final:—

Grammar and Rhetoric:—

1. Kerala Panineeyam,
2. Bhasha Bhushanam,
3. Vrithamanjari

} A. R. Raja Raja Varma, B. V. Book Depot, Trivandrum.

4. Mandanamanjari by D. Padmanabhanunni, B.A., Union Christian College, Alwaye.

5. Keralasahityacharitam Vols. I and II by R. Narayana Panikkar, B.A., L.T., Trivandrum.

6. Sahityacharitra Sangraham by P. Sankaran Nambiyar, M.A. (Saraswathivilasam Book Depot, Trichur.)

7. Nataka Pravesika by A. D. Harisarma, (Deepam Office, Ernakulam.)

8. Bhashayum Sahityavum by Attur Krishna Pisharoty, Palace Tutor, Trivandrum.

9. Sahityacharitam, Part I, by Attur Krishna Pisharoty, (S. R. Book Depot, Trivandrum.)

10. Kavyasāram by Nantyār Veetil K. Paramesvaran Pillai, M.A., Trivandrum.

11. Dravida Vrithangal, etc,. by Appan Thampuran, Ayyan thole Palace, Trichur.

12. Thunchath Ezhuthachan by P. K. Narayana Pillai, B.A., B.L., Trivandrum.

Poetry:—

1. Ramacharitam—1 to 9 patalams.

2. Kuchela Vritham and Krishna Vilasam by C. Achyuta Menon, B.A., University Research Institute, Limbdi Gardens, Royapettah.

3. Rajaratnavaleeyam—Champu—Mangalodayam Press, Trichur.

4. Pandavōdayam by Kodungallur Kochunni Thampuran.

5. Ascharya Chudāmani by Kunhi Kuttan Thampuran, (B. V. Book Depot, Trivandrum.)

6. Svapnavasavadatta by Vallathole—A. R. P. Press, Kunnamkulam, Cochin State.

7. Kalakeyavadham—Kathakali—Kottayath Thampuran

8. Kuchela Vritham—Vanchi Pattu.

Afzal-ul-Ulama Title Examination
1933 and 1934.

Preliminary.—

Tafsir Muhammad Ahduh—Volume II

Al-Mizan by Sha'rani—Vol. I.

Jami'ut Tirmidhi—First half.

Risalatut Tawhid by Ahduh.

Qasidatul Burdah.

Mir'allaqat by Tarafa and Zuhayr.

Al-Fakhari.

Maqmat by Al-Zimakhshari.

Usul-ush-Shashi.

Tahzibul-Mantiq.

For those who do not offer Urdu Translation.—

Kitabul Imamati-was. Siyasah by Ibn-i-Qataybah.

Final.—

Tafsirul—Jawahir—Vol. I.

Sahi-hul Bukhari—1st five Ajza.

Muqaddima-i-Ibn-i-Salah.

Bidayathul Mujtahid by Ibn Rushd—1st Vol.

Nurul-Anwar-Sumiah, Ijma' and Qiyas.

Maqamat-i-Hariri—First ten Maqamahs.

Nasimul Kalam.

Tarikhu-Adabil Lughatil-Arabiyyah by Jurji Zydan—1st Volume.

Diwan-i-Hassan bin Thabit.

Al-Hamasa-Babul Hamasa-wal Marathi.

Tarikhu Umamil Islamiyyah by Alkhizari—Volume II.

Majmu'ul Adab Fi Funnil Arab by Al-yazij.

For those who do not offer Urdu Translation:—

Muqaddima-i-Ibni Khaldun—2nd half.

MUNSHI-I-FAZIL TITLE EXAMINATION
1933 and 1934.

Preliminary.—

Mazamin-i-Sharar—Vol. II—Part I. Geographical and Historical Essays.

Ibnul Waqt.

Musaddas-i-Hali.

Kulliyathi Akbar—Part II.

Sarmaya-i-Danish by Ja'fari.

Quisa-i-Haji Bahah—1st half.

Mard-i-Khasis.

Masnavi Maulana Rum—1st half Daftar.

Lisanul Ghayh by Ja'fari.

Alqiratur Rashidah—Volume III.

FINAL—1933 and 1934.

The same as for 1932.

Examinations for titles in Oriental Learning, 1934.

SANSKRIT

1934

The same as for 1933, with the following modifications :

A. For the preliminary examination of 1934 in Branch II—Advaita, the portion in the Bṛhadāraṇyakabhāṣya will be Chapters II and III only.

B. For the preliminary examination of 1934 in Branch IV—Vyākaraṇa, Kās'ikā-vṛtti will be dropped and the following books are prescribed :—

1. Paribhāṣendus'ekhara (whole)
2. Prauḍhamanoramā text from the beginning to the end of Avyayībhāva.
3. Śabdaratna from the beginning to the end of Strīpratyaya.

For the final division of the examination of 1934, in Branch IV—Vyakaraṇa, the following changes are made.

1. The Kāraka-prakaraṇa in the Laghus'abdendu-sekhara is omitted.
2. In the Laghu-manjūṣā, only the sections containing the Subartha-vicāra and the Nāmārtha-vicāra, are prescribed.
3. All the sections in the Vaiyākaraṇa-bhūṣaṇa-sāra, except the Subartha vicāra and Nāmārtha-vicāra are prescribed.
4. Gadādhara's Vyutpattivāda—from the beginning to the end of Prathamā—is also prescribed.

The remaining books for 1934 Oriental Title examinations will be the same as for 1933.

MARATHI.

1934.

Will be prescribed later.

ORIYA.

1934.

The same as for 1933.

TAMIL.

1934.

VIDVAN.

Under Regulations 7-A and C.

Preliminary—

Poetry—

Chilappathikaram—Pukarkandam—except 3rd Chapter.

Palamoli—1—50 by T. Chelvakesavaraya Mudaliar, M.A.

Naladiyar.

Thevaram—Appar 1—100. IV.

Nalayirapirabantham—1, Iyarpamuthalanthathi—100 stanzas.

Thiruvenkadakkalambagam.

Prose—

Mathivanan—V. G. Suryanarayana Sastriar, B.A.

Panchathanthiram—5th—by S. Anavaratavinayakam Pillai, M.A., L.T.

Essay on Kambar by T. Chelvakesavaroya Mudaliyar, M.A.

Grammar—

Nannul—Viruthiyurai.

Akapporulvilakkam.

Ilakkanavilakkam—Pattiyal.

Final—

Poetry—

Pathuppattu—Thirumurukatrupadai and Pattinappalai.

Purananuru—51—100.

Cheevakachintamani—Pathumaiyarilambakam (246 Stanzas).

Tirukkural—Arathupal.

Grammar—

Tholkappiyam—Cholladikaram, Ilampuranam.

Yapparunkalakkarikai.

Purapporulvenbamalai—1—9 Padalams.

Dandiyalankaram.

Under Regulation 7-B.

Preliminary—

Poetry—

Thiruvengadattandadi.
Maduraikalambakam.
Sekkilar Pillaitamil.
Kalaisaichiledai Venba—1—50.
Chidambaracheyyutkovai.
Tanjaivanankovai.
Villiputhurar Bharatham—6—10 Parvams.
Paranjoti Thiruvilaiyadal, II Kandam.
Pirabulingaleelai—1 to 304 stanzas.
Thakkayagapparani—Kalikku Kulikuriyathu.
Thirukkural—Arathupal—Parimelalagar.

Prose:—

Tamil Varalaru, 2 Parts, by Rao Bahadur K. Srinivasa Pillai.
Tolkappiya Porulathikara Araychi by M. Raghava Ayyangar.
Essay on Kambar by T. Chelvakesavaroya Mudaliar, M.A.
Cholavamsa Charitram by Gopinath Rao, M.A.
Virada Parvam by M. V. Ramanujachari.

Grammar—

Tolkappiyam—Eluthathikaram—Ilampuranam.
Nannul—Eluthathikaram, Sankaranamachivayar.
Akapporulvilakkam.
Purapporul Venba Malai.
Dandiyalankaram.
Yapparunkalakkarikai.
Chidambarappattiyal.

History of Tamil Country—

The same as for 1932 omitting, Tamil Varalaru by K. S. Srinivasa Pillai.

Final—

Purananuru—1—150.

Akananuru—Kalitriyanai Nirai.

Kalithogai—Millaikkali.

Pathupattu—Maduraikanchi.

Paripadal 1—10;

Pathitruppathu—2—6.

Thirukkural—Porutpal—

Chilappathikaram—Maduraikandam.

Perunkathai—Lavanakandam.

Appar Thevaram IV.

Thiruvaimoli.

Kambaramayanam—Ayodhyakandam.

Periyapuranam—Thirunavukkarasar.

Kandapuranam 1—3 Kandams.

Prose—

Inscriptions.

Grammar—

Tholkappiyam—Chol Senavarayam.

Nannul—Viruthi Chol.

Porulathikaram—Akam, Puram, Porul, Maippadu, Nachinarkkiniyam and Perasiriyam.

Yapparunkalaviruthi.

Maranalankaram.

Venbappattiyal.

History of Language and Literature—

Tholkappiyachollathikarakurippu.

Under Regulation 7-D.

Preliminary and Final—

The same as for 7-B—Preliminary and Final.

TELUGU.

1934.

Will be prescribed later.

KANARESE.

1934.

VIDVAN—Under Regulations 7-A and C.

Preliminary:—

Poetry and Prose:—

(1) Vikramarjuna Vijaya by Pampa, Chapters IX and X. (Kannada Academy Edn.). (Viswa Karnataka Publishing House, Chickpet, Bangalore City).

(2) Jagannatha Vijaya by Rudra Bhatta, (Government Oriental Library Edn.). Chapters 1, 2 and 3. (Viswakarnataka Publishing House, Chickpet, Bangalore City.)

(3) Rajasekhara Vilasa by Shadaksharadeva, Chapters 1 and 2. (Viswakarnataka Publishing House, Chickpet, Bangalore City).

(4) Santi Purana by Ponna, Chapters 7 and 8. (People's Printing and Publishing House, Triplicane, Madras.)

(5) Mitra Vinda Govinda Nataka by Singararya, (Kavyakalanidhi Office, Mysore).

(6) Chickadevaraja Vamsavali by Tirumalarya. (Kavyakalanidhi Office, Mysore).

(7) Mudra Manjusha by Kempu Narayana. (Wesleyan Mission Press, Mysore).

Final:—

Grammar, Prosody and Poetics—

(1) Kavirajamarga by Nripatunga. (Madras University Publication).

(2) Rasaratnakara by Salva. (Madras University Publication).

(3) Sabdamanidarpana by Kesiraja. (B. M. Book Depot, Mangalore).

(4) Chhandassu by Nagavarma. (B. M. Book Depot, Mangalore).

(5) Apratima Vira Charite by Tirumalarya. (Kavyakalanidhi Office, Mysore).

(6) Karnataka Vyakaranopanyasamanjari by R. Raghunatha Rao. (Viswa Karnataka Publishing House, Chickpet, Bangalore City),

(7) Muddanna by Raghunatha Rao, (Viswa Karnataka Publishing House, Chickpet, Bangalore City).

(8) Karnataka Kavicharite by R. Narasimhacharya, Vols. I, II, and III. (Author, Malleswaram, Bangalore).

VIDVAN—Under Regulation 7-B.

Preliminary—

Poetry and Prose:—

(1) Bharatesha Vaibhava, Part I, Sandhis 1, 2 and 3 with introduction (Jain Yuvak Sangha, Puttur, S. Kanara).

(2) Sri Rama Pattabhisheka by Mahalakshmi, (Kavyakalanidhi Office, Mysore).

(3) Chickadevaraya Vijaya by Tirumalarya, (Kavyakalanidhi Office, Mysore).

(4) Vatsaraja Kathe—(Kavyakalanidhi Office, Mysore).

(5) Damayanti Swayamvara by Basappa Sastri, (The Visvakarnataka Publishing House, Chickpet, Bangalore).

(6) Chavundaraya Puranam by Chavundaraya, (Visva karnataka Publishing House, Chickpet, Bangalore).

(7) Nagananda Natakam by N. Anantanarayana Sastri, (Visvakarnataka Publishing House, Chickpet, Bangalore).

Grammar.—

Sabdamani Darpana by Kesiraja, (B. M. Book Depot, Mangalore).

Final—

General Literature—

(1) Adipurana by Pampa, Chapters 1, 2 and 3, (Government Oriental Library, Mysore).

(2) Jagannatha Vijaya by Rudra Bhatta, Chapters 4, 5 and 6, (Government Oriental Library, Mysore).

(3) Girijakalyana by Hariharadeva, Chapters 1 to 4 (both inclusive), (Kavyakalanidhi Office, Mysore).

(4) Neminatha Purana by Nemichandra, Chapters 1, 2 and 3, (Kavyakalanidhi Office, Mysore).

(5) Mitravindha Govinda Nataka by Singararya, (Kavyakalanidhi Office, Mysore).

(6) Ramaswamedha by Muddana, (Kavyakalanidhi Office, Mysore).

(7) Tapobala by A. N. Narasimhayya, (Viswakarnataka Publishing House, Chickpet, Bangalore).

(8) Sabara Sankara Vilasa by Shadaksharadeva, (Viswakarnataka Publishing House, Chickpet, Bangalore).

Grammar, Prosody and Rhetoric, etc.

(1) Sabdanusasana by Bhattakalanka, (Omitting the Commentary), (Government Oriental Library, Mysore).

(2) Kavirajamarga by Nripatunga, (Madras University Publication).

(3) Rasaratnakara by Salva, (Madras University Publication).

(4) Apratima Vira Charite by Tirumalarya, (Kavyakalanidhi Office, Mysore).

(5) Chhandombudhi by Nagavarma, (Kavyakalanidhi Office, Mysore).

(6) Karnataka Vyakaranopanyasa Manjari by R. Raghunatha Rao, (Viswakarnataka Publishing House, Chickpet, Bangalore).

(7) Ranna Kavi Prasasthi, (Viswakarnataka Publishing House, Chickpet, Bangalore),

(8) Karnataka Kavi Charite by R. Narasimhacharya, Vols. I, II and III. (Author, Malleswaram, Bangalore).

MALAYALAM.

1934.

The same as for 1933.

AFZAL-UL-ULAMA AND MUNSHI-I-FAZIL.

1934.

The same as for 1933.

Examinations for Titles in Oriental Learning, 1935.

SANSKRIT.

1935

For all the Branches of the Siromani Title and Sanskrit under the Vidvan groups:—

The same as for 1934, subject to the following modifications which take effect from the examinations of 1935:—

In the list of books prescribed for the Preliminary division of Branch VI—Jyotisa—Siromani, *omit Praśnamārga*, and *insert* in its place, " Capīyatrikoṇamiti and Golarekhāgaṇita only in the Golaprakāśa. The portions prescribed in the Golaprakāśa are available at the Chowkhamba Book Depot, Benares, and the Venkateswara Press, Bombay.

To the list of books prescribed for the final division of Branch VI—Jyotiṣa—Śiromani, *add Praśnamārga, Purvārdha only*, and from the same list *omit Daivajnakāmadhenu*, and in its place 'Grahalāghava—from the beginning of the work to the end of *Candragrahaṇādhikāra*—Venkateswara Press, Bombay', should be inserted.

These changes in the list of books for—*Jyotiṣa—Śiromani* will take effect from the examinations of 1935.

APPENDIX XIII.

EXAMINATION FOR CERTIFICATES OF PROFICIENCY IN ORIENTAL LEARNING.

The following syllabuses, for the subjects of the Optional division for Certificates of Proficiency in modern methods of study as applied to Oriental Learning, have been prescribed:—

I.—*Syllabus in Literary Criticism as applied to Sanskrit Literature*

1. *The fundamentals of Sanskrit Poetics*—
   (*a*) Standard of literary taste.

   (*b*) The general characteristics of literature.

   (*c*) Theories of style, its kinds and relation to sense—(*Vritti' Riti, Sayya and Paka*—)

   (*d*) The doctrine of Rasa—

   The theories of Rasa. The different classes of Rasa and their nature. The significance of the Rasa doctrine in literary criticism. The Rasa doctrine as the central theme of the Psychology and Philosophy of literary criticism.

   (*e*) Literary merits and blemishes.

   (*f*) Figures of speech—their literary value.

2. *The History of Sanskrit Poetics*—

   Pre-dhvani schools. The development of the *Dhvani* school. The anumana school. The development of figures of speech.

3. The Kāvya kinds—their characteristics and development.

4. *Śravya-kavya*—

   (*a*) Prose—Development of prose. Kinds of prose-style description, narration, exposition and persuation.

   (*b*) Poetry—Epic-Lyric-Didactic—Satire - Elegy-Devotional poems

   (*c*) Campūs.

5. *Dṛsya-kavya*—

   (*a*) Dramatic kinds, their characteristics and development.

   (*b*) Conventions of the Sanskrit drama.

   (*c*) Principles of dramatic construction.

6. Sanskrit Metres—their bearing on literary criticism.

N.B.—The following books should be studied. They are not prescribed:—

1. Bain—Rhetoric and Composition (single volume book)—Longmans.

2. Crawshaw—The Interpretation of Literature—Macmillan.

3. Hudson—An introduction to the study of literature—George G. Harrap & Co., London.

4. Hass—Daṣarūpaka—(English translation.)

5. Horrwitz—Indian theatre.

The following books are recommended for consultation:—

1. Brander Matthews—A study of the drama—Longmans.

2. Butcher—Aristotle's theory of Poetry and Fine Art with text and translation of the Poetic—Macmillan.

3. Winchester—Some principles of literary criticism—Macmillan.

4. Courthope—Life in Poetry and Law in Taste.

5. Articles on *Poetry*, *Fine Arts* and *Drama* in the Encyclopædia Britannica.

II.—*Syllabus in Indian Philosophy in its relation to Western Philosophy*

The following books are prescribed for study:—

1. A. S. Rappoport—A Primer of Philosophy—(John Murray).

2. P. Deussen—Elements of Metaphysics—(English Trasn.)

3. Max Muller—Six Systems of Philosophy.

4. A. B. Keith—Indian Logic and Atomism—Oxford University Press.

5. Deussen—The Philosophy of the Upanisads (Eng. Trans.).

6. Deussen—The system of the Vedanta.

N.B.—**Candidates are expected to be familiar with the original philosophical texts in Sanskrit on which the above-mentioned works of Max-Muller and Deussen are based.**

III.—*Syllabus for Indo-European Philology with special reference to Sanskrit.*

N.B.—Knowledge, accurate, so far as it goes, but neither extensive nor minutely detailed, is expected under each head.

P.I.E.=Primitive Indo-European; Ind-Ir.=Indo-Iranian; Skt. =Sanskrit; Gk.=Greek; Lat.=Latin; Teut.=Teutonic.

A. General.

1. *Elementary Phonetics.*—(*a*) The organs of speech—production and classification of speech sounds. Quantity: accent sentence, word, and syllable-accent. Glides.

(*b*) Phonetic description of all speech-sounds treated in the course, Phonetic transcription.

(*c*) Sound-change; isolative, conditional; defective imitation and the result of analogy; Meaning of the term 'Law' in Linguistic Science. Dialectal separation. Growth of 'literary' languages. Families of languages. Cognate words and loan words.

2. *The Indo-European Family of Languages.*—The original speech and its earliest dialectal divisions. Branches and sub-branches of the Indo-European family. Some distinguishing characteristics of the Indo-Iranian, Hellenic, Italic, and Teutonic branches.

3. *Indo-Iranian.*—The Indian Sub-Branch. Dialects of Vedic times. Epic dialects. Classical Sanskrit. Middle Indian Speeches, New Indian Speeches.

B. Phonology

4. *The P. I. E. vowel-system.*—The oldest conditions; primary vowels; changes resultant on accent; secondary vowels and syllabic liquids and nasals. Vowel-gradation, quantitative and qualitative; its relation to accent and its bearing on morphology. The later P.I.E. vowel-system prior to the period of language-separation. General treatment of the P.I.E. vowel-system in the oldest Ind-Ir., Gk., Lat. and Teut.

5. The vowel-system of Skt. in its relation to P.I.E. and to the vowel-systems mentioned in IV. Vowel-gradation in Skt.

6. *The P.I. E. Consonant system.*—Classification of the P.I.E. consonants. Earliest dialectal variations; the 'centum' and 'satam' divisions. Treatment of the P.I.E. consonants generally in Ind.-Ir., Gk., Lat. and Teut.

7. Representation of the P.I.E. consonant-system in Skt. liquids and nasals. Plosive consonants. Cerebral consonants (Fortunatov's Law) Palatal and velar consonants (The Law of

palatalization). The law of aspirates (Grassman's Law). Spirants. Semi-vowels.

8. Sandhi, external and internal. Glides in Skt. Anaptyxis (Svarbhakti). Haplology.

C. ACCIDENCE

9. Word-formation. Base, stem and suffix. Prefix-Infix.

10. Skt. compounds, nominal and verbal.

11. Skt. Suffixes primary (krt.) and secondary (ta'ddhita).

12. *Nominal Declension.*—P.I.E. conditions. Number. Grammatical Gender. Case and case-endings. The P.I.E. case-endings. Syncretism. Contamination. Classification of noun-declensions according to suffix. Vowels and consonant-stems.

13. *The noun declensions in Skt.* treated historically and comparatively with reference to P.I.E., Gk., Lat. and Teut. Philological explanation of all case-endings. Comparison of adjectives and formation of adverbs treated philologically.

14. *Numerals.*—Philological treatment of the Skt. numerals.

15. *Pronouns and pronominal adjectives.*—The Skt. pronouns and pronominal adjectives treated philologically with reference to P.I.E., Gk., Lat. and Teut.

16. *The Verb.*—The P.I.E. verbal-system generally treated. Voice, mood, tense, augment, reduplication, personal endings. Thematic and Athematic stems. Types of verbal action.

17. The Skt. verb in its relation to the P.I.E. verbal system Present perfect, aorist and future systems in Skt. Transfer from the athematic to the thematic class. Periphrastic formations. Analogy in the Skt. verbal-system. Derivative verbs—causative, denominative, desiderative, intensive.

18. Voices, moods and tenses in Skt. Infinitive verbal formations.

IV.—*South Indian Languages and Literatures in their bearing on Ancient Indian History and Culture.*

(1) Candidates will be expected to show extensive study in the language of their choice whether they be Dravidian or Sanskrit.

(2) In addition, they will be expected to have studied the literature of these languages in their historical bearings.

(3) They will be further expected to have a competent knowledge of South Indian History, as in the

syllabus prescribed under the heading as above, numbered 3 in APPENDIX III (Page 125).

V.—*Syllabus for Hindu Law and Jurisprudence*

The following nine books are prescribed for study:—

Books in Sanskrit

1. Manu Smṛti with Kullukabhatta's Commentary (whole).
2. Yajñavalkya Smṛti with Mitākṣarā (whole).
3. Jimūtavāhana's Dāyabhāga (whole).
4. Viramitrodaya—Vyavahāra only.
5. Kautilya's Arthasāstra—To be had of Curator, Government Oriental Library, Mysore.

(1) to (4) can be had of Punjab Sanskrit Book Depot, Said Mehta Bazaar, Lahore.

Books in English.

6. Mayne: Hindu Law and Usage.
7. Mayne: Ancient Law.
8. Austin: Jurisprudence.
9. K. L. Sircar: The Mimāmsa Rules of Interpretation (Tagore Law Lectures) (Thacker Spink & Co., Calcutta).

The following three books are recommended for consultation but in no sense prescribed:—

1. Maxwell: On the Interpretation of Statutes.
2. Sidgwick: Elements of Politics.
3. Bentham: Principles of Morals and Legislation.

V.—*Syllabuses of*

(i) *Literary Criticism as applied to Arabic.*

(ii) *Arabian Philosophy in its relation to Western Philosophy, and*

(iii) *Semitic Philology.*

(i) *LITERARY CRITICISM AS APPLIED TO ARABIC*

Criticism on Arabic poetry and prose. In poetry will be included the pre-Islamic and the Islamic poetry.

Books recommended for study:—

1. Naqdush-Shir, by Qudamah b. Jafar.
2. Muwazanah bayna Abi Tammam wal-Buhturi, by Hasan **Amidi.**

3. Al-Umdah, by Ibn Rashiq
4. Kitabul-Aghani.
5. Literary History of the Arabs, by R. A. Nicholson.
6. History of Arabic Literature, by Clement Huart.
7. Arabian Poetry, by Sir Charles Lyall.

(ii) *ARABIAN PHILOSOPHY*

1. The Influence of Aristotle on Arabian Philosophy.
2. The Work of Syrian and Nestorian Translators under the Abbasids.
3. The Mutakallimun and the Reaction under Ghazzali.
4. Sufi-ism.

Books recommended for study:—

1. Works of al-Kindi and al-Farabi.
2. Ghazzali's Ihyau Ulumiddin and Tahafutul-Falasifah.
3. Ibn Rushd's Tahafutul-Falasifah.
4. Al-Milal wal-Nihal, by Al-Shahristani.
5. Al-Insanul-Kamil, by al-Jili.
6. Kashful-Mahjub, by Al-Fujwiri.
7. Al-Risalatul-Qushyriyyah, by al-Qushayri.
8. Philosophy in Islam, by de Boer.
9. Arabian Thought and Its Place in History, by O'Leary.
10. Metaphysics in Persia, by Iqbal.
11. Studies in Islamic Mysticism, by Nicholson.

(iii) *SEMITIC PHILOLOGY*

The meaning of the term Semitic. The original home of the Semitics. The dialects of the Semitic languages. Semitic writing. Semitic alphabet and the changes they undergo. Semitic vowels and consonants, and their permutations. The etymological and syntactical formations and forms in Semitic languages and the various changes and differences undergone by them. Semitic phonology. The relation of the various Semitic dialects with each other. Arabic in its relation with the non-Semitic languages.

Books recommended for study:—

Al-Bayan wal-Tabyin, by al-Jahiz.

Al-Mizhar, by Al-Suyuti.

Al-Muarrab, by al-Jawaliqi.

Shifaul-Ghalil, by Al-Khaffaji.

Kitabul-Azdad, by al-Anbari.

Comparative Grammar of the Semitic Languages, by W. Wright.

Oriental and Linguistic Studies, by Whitney.

VI. Syllabuses of

(i) *Literary Criticism as applied to Persian and* (ii) *Indo-Persian Philology*

(i) *LITERARY CRITICISM AS APPLIED TO PERSIAN POETRY AND PROSE LITERATURE*

Only the literature in 'Modern Persian' will have to be studied

Books recommended for study:—

1. Shirul-Ajam, by Shibli.
2. Khizana-i-Amirah, by Azad Bilgirami.
3. Tazkiratush-Shuara, by Dawlet Shah Samarqandi.
4. Atishkadah, by Lutf Ali Azar.
5. Studies in Islamic Poetry, by Nicholson.
6. Persian Portraits, by Arbuthnot.
7. Literary History of Persia, by Browne.

(ii) *INDO-PERSIAN PHILOLOGY.*

The Aryan family of the world languages with special reference to the Indo-Persian branch thereof. Origin of 'Modern Persian,' its real ancestors. The relation between Avesta and Sanskrit. The various dialects of the old Iranian languages and their limits. The gradual merging of the old Avestan and Pahlavi forms and their admixture with Arabic. Persian phonology in its relation to the other Aryan and Semitic languages. The etymological and syntactical changes undergone by the Persian language comparatively as well as individually.

Books recommended for study:—

1. Sukhandan-i-Fars, by Azad.
2. Indo-Iranian Phonology, by Gray.
3. Avesta, Pahlavi and Ancient Persian Studies.
4. Avesta Grammar by Kanga. (Sanjana).
5. Discourses on Iranian Literature, by D. M. Madan.
6. Literary History of Persia, by Professor Browne.
7. The Authenticity of the Aryan Family of Languages. Pahlavi and Huzwaresh, by Cama.

APPENDIX XIV.

Syllabus for the Diploma Course in French.

First Term.—The work will include the elements of grammar and pronunciation, the use of simple sentences and translation (prepared and unseen). (One of the text-books may be read).

Second Term.—Grammar (continued); more advanced translation; reading of prescribed texts; conversation.

Third Term.—Translation (a) French-English, (b) English-French; conversation and correspondence; completion of prescribed texts; free composition.

GERMAN.

Syllabus.

First Term.—The work will include the elements of grammar and pronunciation, the use of simple sentences and translation (prepared and unseen). (One of the text-books may be read).

Second Term.—Grammar (continued); more advanced translation; reading of prescribed text-books; conversation.

Third Term.—*Translation*—(a) German-English, (b) English-German, conversation and correspondence, completion of prescribed text-books; free composition.

Text-books in French and German—1931-32.

FRENCH.

Victor Hugo	... Cosette (Clarendon Press).
Edmond About	... Le Roi des Montagnes (Blackie & Son).
Léon Laya	... Le Duc Job (Macmillan & Co.).

GERMAN.

1. Draeger and Rumpf	... Deutsche Lesebuch fur Auslander, Part I and Part II (section ii only), (published by Langenscheidtsche Verlagsbuchhandlung).
2. Ad. Schmitthenner	... Die Frûhglocke.

APPENDIX XV.

B.A. DEGREE EXAMINATION

Regulations which were in force prior to 1929-30.

Under graduates proceeding to B.A. or B.A. (Hons.)

1. Undergraduates who have passed the Intermediate Examination in Arts and Science shall undergo a further course of study in an affiliated college varying in length according as they intend to proceed to the Bachelor of Arts Degree Examination or to the Bachelor of Arts (Honours) Degree Examination.

DEGREE OF BACHELOR OF ARTS.

A. Courses of Study.

Courses of Study for B.A.

2. For the B.A. Degree the course shall extend over a period of two years each consisting of three terms ordinarily consecutive and shall comprise instruction in—

Part I. English Language and Literature.

Part II. One of the following groups:—

(i) Mathematics.

(ii-A) Physical Science.

(ii-B) Physical Science.

(iii) Natural Science.

(iv) Psychology, Ethics, and Logic or a Language.

(v) History and Economics.

(vi) Languages other than English.

B. Examinations

Eligibility for the Degree

3. (*a*) No candidate shall be eligible for the degree of Bachelor of Arts until he has passed an examination in English Language and Literature and in one of the optional groups contained in the courses of study.

Admission to Examination

(b) No candidate shall be admitted to the examination unless he has passed the Intermediate Examination in Arts and Science in this University or an examination accepted by the Syndicate as equivalent thereto.

Candidates may appear for whole Examination or for parts

4. A candidate for the B.A. Degree Examination may at his option present himself for the whole or for either Part at any one time.

Subjects for examination Part I—English

5. Candidates shall be examined in—

1. English Language and Literature.

The course shall be (a) Composition on matter supplied by books set for perusal, (b) the study in detail of certain prescribed books.

The books set under (a) may include works of fiction, literary criticism, biography, history, science or philosophy.

Books set under (b) shall be arranged in the following groups:—

(1) Two plays of Shakespeare.

(2) Modern Poetry.

(3) Seventeenth and eighteenth century prose beginning with Dryden.

(4) Nineteenth century prose.

The paper on the books under (a) shall consist exclusively of subjects for short essays, and of these the paper shall contain a larger number than the candidate is permitted to attempt.

The papers set under (b) shall give the candidate an opportunity of showing an acquaintance with the life and work of the authors of the books prescribed.

Part II— Optional Groups

II. One of the following groups at the option of the candidate:—

(i) *Mathematics*

(i) Mathematics

In addition to the subjects prescribed under (*a*) Mathematics, (*b*) Physics, in Group (*i*) for the Intermediate Examination, the course will comprise Algebra, Plane Trigonometry, Geometry, Elements of the Calculus, Dynamics, Hydrostatics, Astronomy, Properties of Matter, and Heat.

Pure Mathematics

Algebra.—Inequalities, Limits, Elementary theorems in convergence and divergence of series. The binomial theorem for a rational index. Exponential and Logarithmic series. Partial fractions, elementary methods for the summation of series. The elementary properties of continued fractions. Indeterminate equations of the first degree. Elementary properties of Determinants. Typical graphs.

$$y = ax^n, \quad y = a/x^n, \quad y = ax + b + c/x, \quad y = ax + b + c/x^2$$

Graphical solution of cubic and biquadratic equations.— General properties of the equation of the *n*th degree and its roots and co-efficients. *Simple* transformations of equations. Reciprocal equations. Approximate solution of numerical equations.

Trigonometry.—Fuller treatment of the Intermediate Course. *Quadrilaterals inscribed in and circumscribed about circles. Regular polygons. Limits of sin x|x and tan x|x as x tends to zero.* DeMoivre's theorem and its *immediate* applications. Summation of elementary trigonometrical series.

Pure Geometry.—As in the Intermediate Course, and in addition; Harmonic ranges and pencils. Inversion.

Geometry of the line, plane, sphere, the right cylinder and the right cone.

The fundamental geometrical properties of the conic sections.

Analytical Geometry.—The Cartesian equations of the straight line and the circle referred to rectangular axes, the parabola, elipse, and hyperbola referred to their principal axes, and the rectangular hyperbola referred to its asymptotes. The general equation of the second degree. The polar equations of the straight line, circle and the conic. Simple problems on the above.

Calculus.—Standard forms and fundamental processes of differentiation and integration. Simple applications of the derivative to geometry, algebra, mechanics and physics. Maxima and minima values of a function of one variable. Theorem of mean value (graphical proof). Approximations and small errors. Curvature, Cartesian formula for the radius of curvature. **Integration by substitution.** Integration by parts. Integration regarded as summation, with simple applications to areas, volumes and surfaces and to mechanics. Solution of the differential equation of simple harmonic motion.

Applied Mathematics.

Dynamics.—Resolution and composition of displacements, velocities, and accelerations. Curves of speed and velocity diagrams. Motion of a particle in one plane under constant accelerations. Simple harmonic motion; composition of simple harmonic motions. Angular velocity and angular acceleration; moment of velocity.

Absolute units of force. Resolution and composition of forces. Angular momentum; moments of inertia in simple cases; the pendulum; determination of g. Work, energy, conservation of energy; energy diagrams. Impact; the ballistic pendulum. Simple cases of the dynamics of strings. Dimensions of dynamical units. Conditions of equilibrium of a body acted on by forces in one plane. Moments, couples. Centre of mass. The theory of simple machines. Laws of friction. Graphical methods with simple applications.

Hydrostatics.—As in Group (ii-A).

Astronomy.—The apparent motion of the heavens Circumpolar stars. The principal constellations and the most conspicuous stars.

The celestial sphere.—Points and lines on it:—Horizon, zenith, poles, meridian, etc.: the equinoxial points, etc.

Celestial co-ordinate; right ascension, declination, etc., latitude and longitude.

The transit circle, the equatorial, the clock. *The transit theodolite.* The sextant and chronometer.

Phenomena depending on change of latitude and longitude of the observer: Magnitude of the earth.

The apparent annual motion of the sun. The constellations of the zodiac. The ecliptic and its obliquity. The equinoxes and the solstices. *The earth's motion round the sun.* The seasons.

Sideral time, apparent solar time, mean solar time. Equation of time. Standard time (India). Civil and astronomical reckoning. Conversion of time.

Explanation of astronomical refraction and parallax. Twilight.

Determination by observation of clock error and rate, of right ascension and declination of a heavenly body, and of the latitude and longitude of a station.

The solar system, and the motion of the planets. *Kepler's laws. Comets and meteors.*

The motion of the moon and her phases. The plane of her orbit. The nodes and their motion. The moon's sideral and synodic periods. Her diameter and distance.

Distances and magnitudes of the sun, moon and planets.

Causes of the eclipses of the sun and the moon. Ecliptic limits. *Number of Eclipses in a year. The Calendar. The use of the Nautical Almanac.*

Properties of matter.—As in Group (ii-A).

Heat.—As in Group (ii-A).

(ii-A) *Physical Science.*

(ii-A) Physical Science

Physics.—The course includes a more extended study of the matter included in the Intermediate course and in addition the following:—

Dynamics.—As in Group (i).

Properties of matter.—Elasticity: Hook's Law. Compressibility of gases (at high and low pressure) and liquids. Compressibility and rigidity of solids; the elastic limits. Strains due to simple longitudinal pull; Young's modulus and its expression in terms of k and n. Bending in one plane of bars of simple cross sectional area; flexural rigidity: application to girders. Simple twisting of wires of circular cross sectional area by couple in plane at right angles to length; torsional rigidity; applications to torsion balance, and shafts.

Diffusion of liquids and gases; analogy with conduction of heat. Osmosis, Viscosity. Pressure of a gas and its explanation on the kinetic theory; Avogadro's hypothesis: Vander Waal's equation.

Hydrostatics.—Thrust of fluid on plane and curved surfaces. Centre of pressure in simple cases. Floating bodies and conditions of stability. Properties of gases; determination of heights by barometer. Pumps, pressure gauges, and hydrostatic machines. Capillary phenomena and their explanation by surface tension; general theory of surface tension.

Heat.—The methods of calorimetry and thermometry. Vapour pressure, critical temperature and pressure. Conduction and diffusion of heat and the determination of constants. Radiation and absorption; laws of cooling. Theory of exchanges; methods of measuring radiation. Laws of thermodynamics; simple applications.

Light.—Velocity of light. Illumination; photometry. Achromatism in lens systems; direct vision spectroscope.

The wave theory; simple interference phenomena. Huygens' principle. Explanation of straight line propa-

gation, reflexion, and refraction of light. Action of mirrors, lenses, etc., reviewed from this standpoint. Simple diffraction phenomena. Gratings and wave length determination. Spectrum analysis; Doppler's principle. Double refraction and polarization of light; rotatory polarization; simple applications.

Magnetism.—Forces on a magnet in a magnetic field. Determination of axes and moment of magnet. Magnetic potential, level surfaces. Interaction of two short magnets; determination of field strength. Magnetic shell; its potential energy in magnetic field. Total normal induction, Gauss' theorem; number of lines of force. Magnetic induction in iron, etc. Theory of magnetism.

The magnetic field of the earth; the elements and their variations; the compass and its corrections.

Electricity.—Electric capacity; specific inductive capacity. Distribution of electricity on surface of conductors; images. Value of electric force in simple cases of distribution. The mechanical force on charged conductors; energy of electrified systems. The dielectric medium; dielectric displacement currents.

Wheatstone's bridge; specific resistance; resistance thermometers. Conductivity of eletrolytes; ionization; migration phenomena; accumulators, Standard cells; the potentiometers system of measurement. Thermoelectricity; application of thermodynamics; thermoelectric diagrams. Electro-magnetic induction; Coefficients of induction; induction coils. Energy of circuit carrying current when placed in a magnetic field; mechanical force on conductors carrying current; moving coil instruments. Lenz's law; illustration from dynamos and motors, etc. Determination of current resistance, E.M.F. in absolute measure. The discharge of a condenser: electric waves.

The elementary theory of the continuous current dynamo and motor and of the alternate current dynamo. General principles of the application of electricity to lighting, power transmission, telegraphy, etc.

Sound.—The transmission of energy through material media by wave motion; speed of propagation of waves of

permanent type. Nature of musical sound; pitch, scales. Reflexion and refraction of sound; influence of wave length. The vibration of strings, bars, plates and gas columns; resonance. Interference and diffraction phenomena. Analysis of sounds. Measurement of wave length, velocity and pitch.

A practical examination will be held to test the candidate's acquaintance with the phenomena and his ability to show them, as well as his ability to make physical measurements. At the practical examination candidates must submit to the Examiner or Examiners their laboratory note-books duly certified by their professors or lecturers as a *bona fide* record of work done by the candidates.

Chemistry.—The course is the same as that prescribed in General Theoretical and Physical Chemistry in (ii-B) excluding the chemistry of the carbon compounds, but the examination will be of a less advanced character than that for candidates taking (ii-B).

A practical examination will be held to test the candidate's ability to make experiments illustrating the subjects included in the course, identifying the more common metals and their compounds (containing not more than one acid and one base), and making simple volumetric analyses with standard solutions of acids, alkalis, potassium permanganate, and of iodine and sodium thiosulphate.

(ii-B) *Physical Science.*

(ii-B) Physical Science.

Chemistry.—*General Theoretical Chemistry and Physical Chemistry.*—The methods of determining equivalents, atomic and molecular weights; the atomic theory; valency; osmotic pressure; the kinetic theory of gases; the properties of solutions; electrolysis and theory of electrolytic dissociation; the relations of the physical properties of substances to their chemical nature, with special reference to the rotation of the plane of polarization, to refraction and dispersion, crystalline form, atomic and molecular volume, emission and absorption spectra.

The law of mass action; the velocity of chemical change; and the relations of chemical energy to heat, and to electrical energy.

The elements (excluding the rare metals) and their compounds studied in detail.

Chemistry of the carbon compounds treated from an elementary standpoint :—

(1) Composition, purification and analysis of organic compounds.

(2) The hydrocarbons of the methane, ethylene and acetylene series and their derivatives.

(3) The alcohols, aldehydes, ketones and their derivatives.

(4) The allyl derivatives of the more important elements.

(5) The fatty acids and their derivatives.

(6) The hydroxy acids and their derivatives.

(7) The unsaturated acids and their derivatives.

(8) The more important members of the carbohydrate group.

(9) Benzene, naphthalene, anthracene and their more important derivatives and reactions.

The practical examination in Chemistry will include—

1. Qualitative analysis, including analysis of mixtures of mineral substances.

2. Quantitative analysis, including (*a*) the estimation of alkalis, alkaline carbonates, and acids, by neutralization, (*b*) determinations involving the use of the permanganate, dichromate, iodine and thiosulphate pro-

cesses, (*c*) the estimation of chlorides and cyanides by titration with silver nitrate, and also with thiocyanate, (*d*) gravimetric determinations of iron, calcium, copper, silver, lead, sulphuric acid, hydrochloric acid, phosphoric acid.

Candidates will be required to be able to standardize the solutions for volumetric analysis.

3. The determination of molecular weights.

4. Preparation of at least six simple organic substances: *e.g.*, Chloroform, Ether, Ethylacetate, Acetic Anhydride, Urea, Nitrobenzene, Aniline; Phenol; Benzoic Acid (from Toluene), Iodobenzene, Salicylic acid, Azodye, etc.

At the practical examination candidates must submit to the Examiner or Examiners their laboratory note books (duly certified by their professors and lecturers) as a *bona fide* record of work done by the candidates.

Physics: *Properties of matter.*—Compressibility of gases (at high and low pressure) and liquids. Diffusion of liquids and gases. Analogy with conduction of heat. Osmosis viscosity, pressure of a gas, and its explanation on the kinetic theory; Avogadro's hypothesis, Vander Waal's equation.

Hydrostatics.—As for candidates taking Group (ii-A).

Heat.—As for candidates taking Group (ii-A).

Light.—As for candidates taking Group (ii-A), but excluding Geometrical Optics.

Electricity.—As for candidates taking Group (ii-A), but excluding Statical Electricity.

The examination in these subjects will be of a less advanced character than that for candidates taking Group

(ii-A). A practical examination will be held to test the candidate's knowledge of the subjects in this syllabus and his ability to make simple Physical measurements.

(*iii*) *Natural Science.*

(iii) Natural Science

Candidates shall take any two of the following subjects, one of the two being a subsidiary subject:—

A. Botany. B. Zoology.

C. Geology D. Human Physiology. (As main only.)

A. Botany. I.—as the main subject.

A. Botany

1. The main points of structure, development, life history and the taxonomic relation of the following groups in general and the Genera in particular:—

BACTERIA.

Cyanophyceæ

Oscillaria, Nostoc, Rivularia.

Chlorophyceæ

Chlamydomonas, Pandorina, Eudorina, Volvox, Ulothrix, Ulava, Enteromorpha, Coleochæte, Protococcus, Scenedesmus, Hydrodictyon, Cladophora, Vaucheria, Caulerpa, Botrydium, Spirogyra, Zygnema, Desmids, Chara, Nittella, Diatoms.

Phæophyceæ

Ectocarpus, Fucus, Sargassum, Dictyota.

Rhodophyceæ

Batrachospermum, Polysiphonia, Gracilaria

Phycomycetes.

Pythium, Phytophthora, Mucor, Rhizopus, Pilobolus.

Ascomycetes.

Erysiphe, Peziza, Xylaria.

Basidiomycetes.

Ustilago, Puccinia, Agaricus, Lycoperdon.

LICHENS.

Bryophytes.

Riccia, Marchantia, Anthoceros, Mosses.

Pteridophytes.

Ferns, Marsilia, Lycopodium, Selaginella.

Gymnosperms.

Pinus, Cyas.

2. The external morphology of flowering plants.

3. The general principles of classification and the distinguishing characteristics of the following Natural Orders as used in the Flora of British India:—

Ranunculaceæ.	Papilionaceæ.
Anonaceæ.	Cæsalpineæ.
Menispermaceæ	Mimoseæ.
Nymphæaceæ.	Rosaceæ.
Cruciferæ.	Combretaceæ.
Capparideæ.	Myrtaceæ.
Caryophyllaceæ.	Lythraceæ.
Guttiferæ.	Cucurbitaceæ.
Malvaceæ.	Umbelliferæ.
Sterculiaceæ.	Rubiaceæ.
Tiliaceæ.	Compositæ.
Geraniaceæ.	Sapotaceæ.
Rutaceæ.	Oleaceæ.
Meliaceæ.	Apocynaceæ.

Rhamneæ.
Sapindaceæ.
Anacardiaceæ.
Solanaceæ.
Scorphularineæ.
Acanthaceæ.
Labiate.
Verbnaceæ.
Amarantaceæ.
Loranthaceæ.
Euphorbiaceæ.
Urticaceæ.
Piperaceæ.
Asclepiadeæ.
Boragineæ.
Convolvulaceæ.
Laurineæ.
Orchideæ.
Scitamineæ.
Amaryllideæ.
Liliaceæ.
Commelinaceæ.
Palmeæ.
Aroideæ.
Cyperaceæ.
Gramineæ.

4. *Physiology.*

The chemical composition of the plant. Materials of plant food and their sources. The nature of soil and importance of its constituents and micro-organisms. Movements of water and gases. Assimilation of carbon and nitrogen. Transpiration and translocation of the assimilated products. Metabolism. Parasitism and other special modes of nutrition. Respiration. The influence of light, heat and gravity. Growth, movements and irritability in plants. Sexual reproduction and its significance. Vegetative reproduction. The phenomena of cross-fertilization. Variation, Heredity and Mendelism. Theories of Evolution and Origin of species.

5. *Histology.*

The structure and modes of the division of the cell, and the nature of its contents. The nature and mode of origin of plastids, cell sap and other cell contents. The physical and chemical properties of protoplasm and cell-wall. The origin, nature and development of plant tissues. Primary and Secondary tissues, and their distribution in the plant body.

Practical Work.

Candidates are expected to be able to make preparations illustrating the form and structure of any plant of the Groups or Orders mentioned in the syllabus and to describe them with sketches sufficient for their identification: to make dissections with the simple microscope of the floral parts of phanerogams, and to make drawings, construct floral diagrams and refer them to their Natural Orders; to describe in technical language plants belonging to any of the Orders or Groups specified in the syllabus.

At the practical examination each candidate must submit his laboratory note-books and a collection of named plants collected and preserved by himself.

II.—as the subsidiary subject.

(1) The structure and life history of the following:--

Bacteria, *Oscillaria*, *Chlamydomonas*, *Pandorina*, *Eudorina*, *Pledorina*, *Volvox*, *Ulothrix*, *Oedogonium*, *Spirogyra*, *Ectocarpus*, *Polysiphonia*, *Nitella*, *Rhizopus*, *Peziza*, *Puccinia*, *Agaricus*, *Marchantia*, *Mosses*, *Selaginella*, *Fern*, *Cycas*, *Pine*.

(2) External Morphology of Flowering plants.

(3) The general principles of classification and the characteristics of the following families:—

Anonaceæ, *Nymphæceæ*, *Leguminosæ*, *Malvaceæ*, *Rutaceæ* *Myrtaceæ*, *Cucurbitaceæ*, *Rubiaceæ*, *Compositæ*, *Apocynaceæ*, *Asclepiadaceæ*, *Convolvulaceæ*, *Solanaceæ*, *Acanthaceæ*, *Labiatæ*, *Amarantaceæ*, *Euphorbiaceæ*, *Urticaceæ*, *Liliaceæ*, *Amaryllideæ*, *Scitamineæ*, *Orchideæ*, *Palmae*, *Cyperaceæ*, *Gramineæ*.

(4) Plant Physiology:—

Chemical composition of the plant, soil and its nature. Photosynthesis, Transpiration, Respiration, Metabolism, Heterotrophic Plants, Growth, Movements, Irritability, Reproduction (Sexual and Asexual), Cross and Self Fertilization, Variation, Heredity and Mendelism. Theories of Evolution and the Origin of Species.

(5) Histology:—

Cell structure and Cell division, plastids, Cell-saps, other Cell contents, the origin, nature and development of Plant-tissues. Primary and Secondary tissues and their distribution in the plant body.

B. Zoology. I.—As the main subject.

B. Zoology.

The Scope of Zoology.—The leading features in the structure, the most important points concerning the development, the affinities, and the general classification of the forms included in the following groups (except in rare cases, no knowledge of extinct forms will be required):—

Protozoa. Porifera. Cœlenterata. Platyhelmia. Nemertini. Nematoda. Acanthecephala. Chætognatha. Rotifera. Brachiopoda. Annelida. Phoronidæ. Polyzoa. Arthropoda. Mollusca. Echinodermata. Chordata.

A general acquaintance with the vertebrate fauna of South India.

The geographical distribution of the more interesting groups of the Chordata. Outlines of the theory of organic evolution. Evidences on which the theory is based.

Candidates will be required to examine, describe, identify, or otherwise deal with specimens and preparations illustrating points of zoological interest in connection with any of the preceding groups. They will, in addition, be expected to have a full practical knowledge of the structure, and will be required to make dissections and simple microscopic preparations of any of the following types:—

Amœba. Vorticella. Hydra. Earthworm. Leech. Prawn and Crab (external characters). Scorpion. Centipede (external characters). Cockroach. Fresh-water Mussel. Amphioxus (preparations and sections). Dogfish (skeleton). Frog. Pigeon. Hare.

Candidates may also be examined by *viva vice* questions.

II. As the subsidiary subject.

SYLLABUS FOR ZOOLOGY SUBSIDIARY.

The scope of Zoology :—The leading features in the structure, the most important points concerning the development, and the affinities of the forms included in the following Phyla in general and of the following types in particular.

Students will not be expected to be familiar with characters of orders or other sub-groups not mentioned in the following scheme.

Protozoa—*Rhizopoda.* (Lobosa, Foraminifera, Heliozoa and Radiolaria.)

Mastigophora. (Flagellata)

Infusoria. (Ciliata)

Sporozoa.

Types—Amoeba, Euglena, Volvox, Paramoecium, Vorticella, Monocystis and Malarial Parasite.

Coelenterata—*Hydromedusæ.*—(Hydrida, Gymnoblastea, Anthomedusae, Calyptoblastea, Leptomedusae, Trachymedusae, Narcomedusae, Hydrocorallina and Siphonophora).

Scyphomedusae. (Stauromedusae, Coronata, Cubomedusae and Discomedusae).

Anthozoa. (Zoantharia and Alcyonaria)

Ctenophora.

Types—Hydra, Obelia, Aurelia, Sea. Anemone and Hormiphora.

Ptatyhelminthes—Types—Taenia and Liver Fluke. (Fasciola).

Nemathelminthes—Type—Ascaris.

Annelida—
Archiannelida
Chaetopoda (Polychaeta and Oligochaeta)
Hirudinea
Echiuroidea

Types—Nereis, Earthworm and Leech.

Arthropoda—*Crustacea.* (Entomostraca and Malacostraca)
Types—Streptocephalus, Lepas, Sacculina, Prawn and Crab.

Onychophora—Peripatus.
Myriapoda (Centipedes and Millipedes)

Insecta. (Aptera, Orthoptera, Coleoptera, Neuroptera, Hymenoptera, Hemiptera, Diptera and Lepidoptera)
Type—Cockroach.

Arachnida (Scorpions, Spiders and Kingcrab)
Type—Scorpion.

Mollusca—Pelecypoda
Gastropoda
Cephalopoda

Types—Mussel, Chiton, Pila (Ampullaria) and Sepia.

Echinodernata—Asteroidea.
Ophiuroidea.
Echinoidea.
Holothuroidea.
Crinoidea.

Types—Star fish, Brittle star, Sea-urchin, Sea-Cucumber and Feather Star.

CHORDATA.

Prochordates—Balanoglossus, Ascidia and Amphioxus.

Vertebrata—Pisces—Elasmobranchii.
Teleostomi.
Dipnoi.

Amphibia ... { Anura, Urodela, Gymnophiona.

Reptilia ... { Lacertilia, Ophidia, Chelonia, Crocodilia

Aves ... Archeornithes; Neornithes--(Ratitae & Carinatae.,

Mammalia Prototheria.

Metatheria .. Diprotondontia; Polyprotodontia

Eutheria ... Edentata; Sirenia; Cetacea; Proboscidea; Ungulata; Hyracoidea; Rodentia; Carnivora; Insectivora; Chiroptera; Prosimiae; Primates.

Types—Balanoglossus, Ascidian, Amphioxus, Dog fish, Bony fish, Frog, Calotes, Pigeon and Rabbit.

A general knowledge of the theory of Evolution.

Practical Work—

Candidates will be expected to have a practical knowledge of the structure and shall be required to make dissections and simple microscopic preparations of any of the following types :—

Earthworm, Nereis, Leech, Prawn (external features); Scorpion ; Cockroach ; Fresh-water Mussel, Ampullaria (Pila), Sepia, (external features) Frog (sympathetic system and 7th cranial nerve excepted) ; Pigeon, Rabbit (nerves excepted).

C. Geology

C. GEOLOGY. I—as a main subject.

I. Physiography.

II. Mineralogy and Crystallography.

III. Petrology.

IV. Structural and field Geology.

V. Stratigraphy and Palæontology.

I. PHYSIOGRAPHY.

An elementary course of lectures on the following:—

The earth as a planet, its general relations to the other members of the solar system; hypotheses as to the origin of the earth; form, size and density of the earth; its movements and their effects.

The Atmosphere—its composition, height, density, pressure, temperature, moisture and movements; weather; refraction, twilight and aurora-borealis.

The Hydrosphere—its composition, extent and distribution, depth, temperature and movements.

The Lithosphere—the chief constituents of the earth's crust, the general characters and mode of occurrence of igneous and sedimentary rocks. Condition of the interior of the earth.

Agents of Geological change.—The hypogene and epigene agents of geological change, manner and results of their action, especially as influencing earth-sculpture—the destruction, construction, and gradual evolution of the crust of the earth and of its surface features.

Fossils, the main conditions favourable for their formation and preservation and their value as interpreters of the past history of the earth.

Climates—their causes and distribution; glacial epochs.

Simple facts about the geographical and geological distribution of the chief types of plant and animal life. Antiquity of man. Views as to the age of the earth's crust.

II. MINERALOGY AND CRYSTALLOGRAPHY

Symmetry; lines, planes and axes of Symmetry; laws of Crystallography; the common holohedral, hemihedral and hemimorphic crystal forms and combinations under each of the six crystal systems; the more important types of twins and twinning; drawing of the more important crystal forms; systems of crystal notation, use of the contact Goniometer.

The principal physical properties of minerals which aid in the recognition of the various mineral species.

Isomorphism, paramorphism, pseudomorphism and dimorphism.

The chief characteristics of all the more abundant minerals, including both those which are of geological interest and those of commercial value, their modes of occurrence and uses.

The practical determination of the chief physical and chemical properties of the commoner ores and minerals, including the use of the blowpipe.

III. PETROLOGY.

The classification and distribution of rocks, and the composition, structure, texture, origin and mode of occurrence of all the more important types and their metamorphic and altered forms.

Contact and Regional Metamorphism.

The macroscopic and microscopic examination of rocks including the determination of the simpler optical characters of the chief rock forming minerals in parallel polarized light. Preparation of diagrams or sketches to represent features observed in rock sections under the microscope. Construction and use of a simple petrological microscope.

IV. STRUCTURAL AND FIELD GEOLOGY.

The more important lithological and structural features of rocks, their origin or formation: structure of mineral veins. Diagrammatic sketches of the above.

Construction and interpretation of geological maps and sections. Tracing of outcrops. Simple problems in structural geology.

V. STRATIGRAPHY AND PALÆONTOLOGY.

The chief petrological and palæontological characters of the main geological divisions and their Indian representatives and the probable physical conditions under which they were formed.

Fossils, their nature and preservation. The main groups of vegetable and animal life and their distribution in time.

The characters, classification and distribution of the more important types of fossils—especially Indian; identification and sketching of fossils; causes for the imperfection of the geological record; the general succession of life as revealed thereby and the general evidence furnished on support of evolution; principles of correlation; Homotaxis.

VI. PRACTICAL EXAMINATION

The knowledge of the candidate in accordance with the syllabus will be tested also by practical examination. *Viva voce* questions may be asked, acquaintance with field work is necessary.

II.—As the subsidiary subject.

Vide page 98.

D. HUMAN PHYSIOLOGY.—as the main subject. For syllabus, *vide* page 403.

(iv) *Psychology, Ethics, and Logic or a Language.*

(iv) Psychology, Ethics, Logic or a Language

(1) Psychology, (2) Ethics, (3) A philosophical work to be prescribed annually in whole or in part, (4) Logic and the Theory of Knowledge, *or* a Language.

Text-books will be recommended from time to time as indicating the scope and standard of the examination, but the questions will not be confined to the books recommended.

The courses in the several languages shall be as follows:—

(1) Sanskrit.—Extracts from Indian Philosophical Literature.

(2) Persian *or* Arabic.—Extracts from the Philosophical Literature of those Languages.

(3) The Dravidian Languages, Oriya, Marathi, Urdu or Hebrew.

Books of the same standard of difficulty as those prescribed under Group (vi).

(4) Greek or Latin.—Portions of Plato or Aristotle *or* of the philosophical writings of Cicero, respectively

(5) French or German.—Selections from French or German Philosophical Literature.

In each language there shall be one paper of three hours' duration which shall contain questions on the subject-matter of the set books, a critical knowledge of which will be required, and also passages from those books for translation into English and explanation, together with unseen passages for translation into English from the selected Classical or Foreign language or original composition in the selected vernacular language.

(v) *History and Economics.*

Either A.

(v) History and Economics

(1) General Indian History, (2) Constitutional History of Great Britain and Ireland, (3) Outlines of European History, A.D. 476 to A.D. 1878, (4) Elements of Economics, (5) Political Science *or* a Language.

The courses in the several languages shall be as follows:—

(1) Sanskrit.—Extracts from the Vedic and Classical Literature illustrative of Indian History.

(2) Persian *or* Arabic.—Extracts from the Classical Literature illustrative of Muslim History.

(3) The Dravidian Languages, Oriya, Marathi, Urdu or Hebrew.

Books of the same standard of difficulty as those prescribed under Group (vi).

(4) Greek or Latin.—Prescribed portions of Greek or Roman Historians.

(5) French or German.—Prescribed portions of French or German Historians.

In each language there shall be one paper of three hours' duration which shall contain questions on the subject matter of the set books, a critical knowledge of which will be required, and also passages from those books for translation into English and explanation, together with unseen passages for translation into English from the selected Classical or Foreign language, or original composition in the selected vernacular language

or B.

(1) Economics—General,

(2) Economics—Special I,

(3) Economics—Special II,

(4) Modern History, according to a syllabus.

(5) Indian History, according to a syllabus.

(vi) *Languages other than English.*

(vi) Languages other than English

Candidates may select any one of the following languages, which shall be taken in conjunction with the related subject or related language specified for each language in the following lists:—

Selected Language	*Related Subject*
Sanskrit.	Early Indian History.
Persian or Arabic.	Early Muslim History.
Urdu.	Indian History—Muslim Period.
Tamil, Telugu, Malayalam or Kanarese.	Early South Indian History.
Oriya.	Early History of Orissa.
Greek or Latin.	A special period of Greek or Roman History respectively.
Marathi.	History of the Marathas.
German or French.	A special period of Modern European History.
Hebrew.	History of the Jews.
	Related Language.
Sanskrit, Arabic, Persian, Hebrew, Greek, Latin, German or French.	None.
Dravidian Languages, Marathi or Oriya,	Sanskrit.
Urdu.	Arabic or Persian.

The courses of study in the several languages shall be as follows:—

(1) (*a*) *Sanskrit* (*Main*).

Sanskrit Language and Literature. The course shall be:—

(*a*) Selections from the Early Period, including Vedic Mantras, Brahmanas, Aranyakas and Upanishads and the Sutra literature.

(*b*) Selections in prose and verse from the Later Period, including the Dharmasastras, and the Itihasa, Kavya and Nataka literature.

A knowledge of Alamkara-sastra will be required sufficient for the correct understanding of native commentators.

(*c*) Sanskrit Grammar treated historically and comparatively in accordance with a syllabus.

(*d*) Translation from and into Sanskrit.

(*e*) General History of Sanskrit Literature.

(*f*) Early Indian History.

In the examination there shall be two papers, each of three hours' duration in subject (*b*) and one paper of three hours' duration in each of other subjects, except Translation which will form part of the papers set on (*a*) and (*b*) above.

(*b*) *Sanskrit* (*Subsidiary*).

The course shall consist of the study of one drama of the classical period and portions of one Kavya. In the examination there shall be one paper of three hours' duration which shall include pieces for translation from Sanskrit into the main language.

(2) *Urdu.*

The course shall consist of:—

(*a*) Prose books from different periods, including at least one modern work.

(*b*) Poetry books from different periods, including at least one modern work.

(c) Translation from prose and poetry books other than the set books, translation from English into Urdu to be made in an approved modern style.

(*d*) History of Language and Literature.

(*e*) Indian History—Muslim Period, *or* Arabic or Persian.

(3) (*a*) *Arabic or Persian* (*Main*).

The course shall consist of:—

(*a*) Prose books selected from different periods.

(*b*) Poetry books selected from different periods.

(*c*) Translation from prose books other than the set books: translation from the set poetry books and from English into Arabic *or* Persian Prose.

(*d*) History of Language and Literature with special reference to the set books.

(*e*) A selected period of early Muslim History.

The periods of History for Persian or Arabic may be one or other of the following:—

1. The four first Khalifas and the Umayyad Khalifate, excluding Africa and Spain.
2. The Abbasid Khalifate, excluding Africa and Spain and the wars of the Crusades.
3. The Muslim conquest of Egypt and Northern Africa until the fall of the Abbasid Khalifate and excluding the wars of the Crusades.
4. The Arab conquest of and rule in Spain.
5. The wars of the Crusades.

(*b*) *Arabic or Persian* (*Subsidiary*).

The course shall consist of the study of selected pieces from one poet of the classical period and selected portions from the works of one standard prose writer. There shall be one paper in the examination of three hours' duration which shall include pieces for translation from Arabic or Persian into the main language.

(4) *Tamil, Telugu, Kanarese or Malayalam.*

*The course shall be:—

(*a*) The study of selections representative of the several periods of the literature of the selected language including one or more inscriptions.

(*b*) The history of the literature with special reference to the set books.

(*c*) The elements of the Grammar, including the elements of the Prosody and Rhetoric of the language, and the history of the language as illustrated by the set books.

(*d*) The elements of the Comparative Grammar of the Dravidian Languages.

(*e*) Composition.

(*f*) Early South Indian History *or* Sanskrit.

(5) *Oriya or Marathi.*

The course shall be the same as for the Dravidian Languages, with the substitution of Gaudian Grammar for Dravidian Grammar, and of the Early History of Orissa or the History of the Marathas respectively for Early South Indian History.

(6) *Greek or Latin.*

The course shall consist of:—

(*a*) Prescribed portions of the writings of the more important Greek or Latin authors.

(*b*) Grammar of the language with reference to Indo-Germanic Grammar.

(*c*) Greek or Latin Prose composition and translation of unprepared passages.

(*d*) A general knowledge of Greek History to the death of Alexander, or of Roman History to the death of Trajan, with a more minute knowledge of some prescribed period.

*Subject to alterations.

(e) A general knowledge of Greek or Roman Literature with a more minute knowledge of the authors of the prescribed books.

(7) *French or German.*

The course shall consist of:—

(a) The study of set books representative of various periods of French or German literature.

(b) The History of French or German literature with special reference to the set books.

(c) The history of the French or German language.

(d) Translation from French or German into English, and of English into French or German.

(e) Composition.

(f) A period of European History with special reference to French or German History.

In the examination the subjects for composition shall be taken from the set books or shall relate to the periods of French or German literary or political history studied in the course. In the translation paper, the passages set for translation from French or German into English shall be specimens of modern French or German, not taken from the set books.

(8) *Hebrew.*

The course shall consist of:—

(a) Set books.

(b) Grammar and translation from and into Hebrew.

(c) History of the Language and the Literature.

(d) A selected period or periods of the History of the Jews.

Marks qualifying for a pass

6. A candidate shall be declared to have passed the examination in English if he obtains not less than thirty-five per cent. of the total number of marks. A candidate shall be declared to have passed in an optional group if he obtains not less than thirty-five per cent. of the total marks, and not less than thirty per cent. in each division of the examination. All other candidates shall be deemed to have failed in the examination. The divisions shall be as follows:—

Divisions of the examination

Group (i) (*a*) Pure Mathematics, (*b*) Applied Mathematics.

Group (ii) (*a*) The written examination in the main subject, (*b*) the practical examination in the main subject, (*c*) The subsidiary subject.

Group (iii) (*a*) The written examination in the main subject, (*b*) The practical examination in the main subject, (*c*) The subsidiary subject.

Group (iv) (*a*) Psychology and special subjects, (*b*) Ethics and Logic *or* a Language.

Group (v) A. (*a*) Indian, European and Constitutional History, (*b*) Economics and Political Science *or* a language.

Group (v) B. (*a*) Economics, (*b*) History.

Group (vi) (*a*) Selected language, (*b*) Related subject or Language.

Classification of successful candidates

There shall be separate lists for the English language part and for each of the optional groups. Successful candidates obtaining not less than sixty per cent. of the total marks in English or in an optional group shall be placed in the first class. Successful candidates obtaining less than sixty per cent. and not less than fifty per cent. shall be placed in the second class. Successful candidates obtaining less than fifty per cent. shall be placed in the third class.

SYLLABUS

B.A. DEGREE EXAMINATION.

PRACTICAL PHYSICS FOR GROUP (i) (MATHEMATICS)

The following scheme is intended to indicate the nature and extent of the course of instruction in Practical Physics for candidates in Group (i) B.A. Degree:—

(1) Application of the method of least squares to the treatment of a series of observations; probable error.

(2) Observation of damped oscillations: logarithmic decrement.

(3) Composition of simple harmonic motions of different phases, amplitudes or periods, in the same or different directions.

(4) Calibration of a glass tube.

(5) Comparison of aneroid and standard barometers under different conditions of temperature and pressure.

(6) Surface tension.

(7) Viscosity of a liquid by flow in a narrow tube.

(8) Stress-train curves: Young's modulus: elastic limit

(9) Determination of moments of inertia.

(10) Determination of *g*. compound pendulum.

(11) The balance: Zero of unloaded balance: curve of sensitiveness: ratio of arms: calibration of a set of weights.

(12) Determination of vapour pressures: use of empirical formulæ.

(13) Law of cooling curves.

(14) Specific heat by the method of mixtures with radiation correction.

(15) Ratio of the specific heats of a gas.

(16) Determination of thermal conductivity.

(17) Determination of J.

NATURAL SCIENCE

For syllabuses in Botany, Zoology and Geology—*Vide* pages 383—393.

SYLLABUS OF THE COURSE IN PHYSIOLOGY FOR GROUP III-D.

D. PHYSIOLOGY. Definition and Scope of Physiology. Problem of Physiology. Living and dead matter. The cell. Protoplasm and its properties. Histology of the principal tissues and organs of the body. Chemical composition of the body. Muscle. Irritability. Contractility. Muscle-nerve preparation. Muscular contraction. Changes during contraction. Nature of muscular and nervous action. Electrotonus. Circulatory system and circulation. Regulation of the vascular mechanism. Vasomotor action. Inflammation. Composition of blood. Coagulation of the blood. Lymphatic system. Nature and movements of lymph. Secreting glands. Food-stuffs. Nature, properties and secretion of saliva, gastric juice, bile, pancreatic juice, and succus entericus. Mechanism of digestion. Changes which food undergoes in the alimentary canal. Absorption. Liver and its work. The ductless glands and what is known about their functions. Respiration. Respiratory mechanism. Nervous mechanism of respiration. Changes of the air during respiration. Changes in the blood. Respiration of the tissues. Asphyxia. Effect of respiration on the circulation. Special respiratory movements. Cutaneous respiration. Composition, character and secretion of urine. Urinary apparatus. Micturition. Nature and composition of sweat. Mechanism of the secretion of sweat. General metabolism. Statistics of nutrition Diet. Energy of the body. Temperature of the body. Production and regulation of animal heat. Nerves and nerve-functions. Trophic nerves. Columns and tracts of the spinal cord; evidence for their existence. Functions of the cord. Reflex action. Structure of the brain. Disposition and connections of the grey and white matter of the brain. Functions of the brain. Removal of the cerebrum. Localization of cerebral functions. Cerebellum. Machinery of coordinated movements. Sensations. Structure of the eye. The eye as an optical instrument. Accommodation. Imperfections in the visual apparatus. Features of visual sensation. Colour sensation. Binocular vision. Visual judgments. Structure of the ear. Auditory sensation. Taste and smell. Cutaneous sensations. Muscular sense. Mechanism of locomotion, voice and speech. Impregnation. Outlines of the development of the embryo and its envelopes. Nutrition of the embryo. Birth. Lactation. Phases of life. Death.

Practical Examination.—Candidates must be prepared to answer *viva voce* questions, to examine, stain, mount and describe sections, and to identify microscopic preparations. They must show their practical acquaintance with the chemistry of albumin and its allies, milk, glycogen, the digestive juices (and their action on food), blood and urine. They will be expected to be familiar with the use of the most important apparatus employed in studying the physiology of muscle, nerve, the circulatory and respiratory systems and the organs of sense.

Taken as a subsidiary subject. Physiology shall include a knowledge of the essential facts of the structure and functions of the body as indicated below:—

Food, digestion and absorption. Nature, composition and functions of the blood. Circulation. Vasomotor action. Lymph. Respiration and the respiratory mechanism. Secretion. Work of the liver. Sweat and its formation. Work of the kidneys. Temperature of the body and its maintenance. Various modes in which muscles give rise to movement. Functions of the principal parts of the central nervous system. Functions of nerves. Reflex action. General account of the sensory organs.

In the practical examination candidates will be expected to answer *viva voce* questions, and to identify microscopical preparations. They must show their practical acquaintance with the chemistry of albumin, milk, and urine, and with the action of the digestive ferments on food. They may be required to take tracings of a simple muscular contraction, and of a contracting heart.

HISTORY AND ECONOMICS

Syllabus in Modern History for Group (v-B)

Modern History, 1500—1878

In addition to a knowledge of the development of the European State System as set forth in the Syllabus, a knowledge of the origin and working of the constitutions of the chief countries will be required, *viz.*, of England and Switzerland and, after 1870, of France, Germany, Italy and the British Commonwealth. Books recommended for the study of the constitutions:—

For England, Switzerland, France, Germany and Italy:—

(1) Ogg: "Government of Europe" or, Lowell: "Greater European Governments."

(2) Herman Finnes—"Foreign Governments at work" (World of To-day Series, Clarendon Press).

For the British Commonwealth.

(1) H. Duncan Hall—"The British Commonwealth of Nations."

(2) A. B. Keith: "Dominion Home Rule in Practice." (World of To-day Series, Clarendon Press.)

(1) *Introduction—*

Features of Mediaeval Europe:—Papacy—Empire—Feudalism—their decay. Decline of Byzantine Empire.

The New Age:—Renaissance—Reformation—Maritime discoveries—Transfer of political power to Atlantic States—Spain—Portugal—France—Holland—England.

(2) *Sixteenth century—*

Supremacy of Spain under the Hapsburgs.

The development of the Hapsburg power and its extent under Charles V and Philip II. Its challenge to Europe:—

(*a*) France, (*b*) Germany, (*c*) Netherlands, (*d*) England, (*e*) Turkey.

The relation of the Reformation and Counter-Reformation to the struggle.

(3) *Seventeenth century.*

(A) Ascendancy of France.

(i) Henry IV—Richelieu—Mazarin.

Opportunity afforded by religious struggle in Germany.

(ii) France under Louis XIV—His system of Alliances—

Sweden—Turkey—England. The challenge to Europe:—

(*a*) Holland, (*b*) Spain, (*c*) The Empire, (*d*) England

(B) Northern Europe.

Ascendancy of Sweden under House of Vasa. Her challenge to North Europe:—(*a*) Denmark, (*b*) The Empire, (*c*) Poland, (*d*) Russia.

(C) South-Eastern Europe.

Revival of Turkish Power—its relation to Western politics—its challenge to Austria and Poland. Position of Turkey at close of century.

(4) *Eighteenth century—*

The rise of England—Prussia—Russia.

(*A*) *England*—Her position in Europe and overseas after Treaty of Utretcht. Expansion and challenge to (*a*) France and Spain, (*b*) Holland.

(*B*) *Prussia.*—Her position under Frederick II. His challenge to Austria—and German Princes—Relations with France—Russia—England.

(*C*) *Russia.*—Her position in Baltic after Treaty of Nystadt. Her challenge to (*a*) Germany, (*b*) Poland, (*c*) Turkey.

(5) *French Revolution*—

(*A*) Its causes, characteristics and course.—Its challenge to Europe:—

(*a*) The Empire (Netherlands, Germany and Italy), (*b*) England.

(*B*) The Napoleonic Empire.

Its rise and development—its challenge to Europe:—

(*a*) The Empire, (*b*) England, (*c*) Russia, (*d*) Spain, (*e*) Portugal. Its overthrow—Congress of Vienna.

(6) *Nineteenth century*—

The challenge of Vienna to Liberalism and Nationality. Influence of Metternich.

(*A*) *Liberal movements*—

(i) 1815—1825. Germany—Spain—Italy. Suppression by Quadruple Alliance.

(ii) 1830. Revolution in France and its consequences in Belgium—Poland—Germany—Italy—Spain—England.

(iii) 1848. Revolution in France and its consequences in Austria—Hungary—Italy—Prussia—England—Collapse and re-action. Fall of Metternich—establishment of the Second Empire in France.

(*B*) *National movements*—

(i) Union of Italy.

(ii) Unification of Germany and the establishment of the German Empire—the French Republic.

(*C*) *The Eastern Question*—

Russia's challenge to Turkey—Anglo-French support to Turkey.

(i) War of Greek Independence.

(ii) Turko-Egyptian War.

(iii) Crimean War.

(iv) Balkan Risings and Russo-Turkish War. Congress at Berlin.

Books recommended for study—

1. Lowell's Greater European Governments.
2. Keith's Dominion Home Rule in Practice.
3. Finner-Foreign Governments at Work (World of To-day series, Oxford).
4. (*a*) Ogg—The Governments of Europe.
   (*b*) Keith—The Constitution, Administration and Laws of the Empire.
   (*c*) Bryce—Modern Democracies.

Sanskrit

(7) SYLLABUS FOR SANSKRIT GRAMMAR FOR GROUP (vi)—LANGUAGES OTHER THAN ENGLISH

Sanskrit.

The same as for B.A. Group (v) under the new Regulations. (Vide Appendix III).

(8) *Syllabus for the Comparative Grammar of the Dravidian Languages for Group* (vi).

The same as for B.A. Group (v) under the new Regulations. (Vide Appendix III).

(9) *Related Subject:—The Dravidian Languages: Syllabus for Early South Indian History.*

The same as for B.A. Group (v) under the new Regulations. (Vide Appendix III).

(10) *Syllabus for the Comparative Grammar of the Dravidian Languages for Group* (vi).

The same as for B.A. Group (v) under the New Regulations (Vide Appendix III).

(11) *Syllabus for the History of the respective Dravidian Languages—Tamil, Telugu, Kanarese and Malayalam.*

The same as for B.A. Group (v) under the new Regulations (Vide Appendix III).

TEXT BOOKS FOR 1931

ENGLISH.

1931

*Shakespeare: *Hamlet, Much ado about Nothing.*

Modern Poetry—

Milton: Lycidas.

Wordsworth: Tintern Abbey.
Shelley: Adonais.
Browning: Andrea del Sarto.
Rossetti: The Blessed Damozel.
} Published in Pattern Poetry III—Thomas Nelson & Sons.

and the following selections from

"A third book of Modern Poetry", Edited by H. Treble—(Macmillan & Co.).

Nos. II, V, VII, XIII, XV, XVII. (*Vide* page 136).

17th and 18th Century Prose—

Swift: Gulliver's Travels, Parts I and II—University of London Press.

Burke: Letter to a Noble Lord.

‡Johnson: Prose Selections in Johnson: Prose and Poetry (Clarandon Series)—(Oxford University Press).

Note:—

*Under Shakespeare, the Old Regulation and the Transitory Regulation candidates will study only the †three plays prescribed under the New Regulations and not the life and work of the author as under old Regulations.

The question papers will be common to all candidates in Shakespeare and Modern Poetry, and the papers in Prose and Composition will be different.

For the examination of 1931 the candidates shall be required to show a general knowledge of the following three plays:—

†Henry IV, Part I.

†Antony and Cleopatra.

†The Tempest.

‡Candidates are required to show a knowledge of the introductory Essays.

19th Century Prose—

Hazlitt: Twenty-two Essays, Edited by Beatty-Heath & Co., (Omitting Essays Nos. 5, 6, 7, 8, 9, 10 and 19)

or

Lamb's Essay of Elia, First Series, edited by A. H. Thompson.

Newman: Literary Selections. (Longmans, Green & Co., Indian University Ed.).

Arnold: Selections. Edited by H. W. Rawlinson—Macmillan and Co.

Non-detailed Study—

*Jane Austen: *Emma.*

*Hardy: *Far from the Madding Crowd.*

*Selected English Short Stories. Third Series (World's Classics).

PHYSICAL SCIENCE.

PART II

1931

GROUP (ii-A) AND (ii-B).

PHYSICS

GROUP (ii-A).

Physics—

Wagstaff: Properties of Matter (Clive).

Edser: General Physics (Macmillan).

Poynting and Thompson: Sound (Griffin).

Catchpool: Sound (Clive).

Capstick: Sound (Cambridge University Press).

Edser: Heat (Macmillan).

Edser: Light (Macmillan).

Hadley: Electricity and Magnetism (Macmillan).

Brooks and Poyses: Electricity and Magnetism (Longmans).

*Text-books to be studied for the additional paper in composition by candidates who passed the Intermediate Examination under the old Regulations and study for the B.A. Degree Examination under the Transitory Regulations.

Whetham: Experimental Electricity (Cambridge University Press).

Schuster and Lees: Practical Physics (Cambridge University Press).

Allen and Moore: Text-book of Practical Physics (Macmillan).

Reference—

Porter: Intermediate Course in Mechanics (Murray).

Scarle: Experimental Elasticity (Cambridge University Press).

Poynting and Thomson: Heat (Griffin).

Clay: Treatise on Practical Light (Macmillan).

Watson: Practical Physics (Longmans).

(ii-B).

Physics—

Wagstaff: Properties of Matter (Clive), omitting Chapters IX, X, XII and XIV.

Edser: Heat (Macmillan).

Edser: Light (Macmillan).

Brooks and Poyser: Electricity and Magnetism (Longmans).

Schuster and Lees: Practical Physics (Cambridge University Press).

Allan and Moore: Text-book of Practical Physics (Macmillan).

Group (ii-A).

Chemistry—

Smith—Introduction to Inorganic Chemistry, (Bell).

Senter—Outlines of Physical Chemistry, (Mathuen).

Barrett, W. H.—Elementary Physical Chemistry, (Ed. Arnold).

Thorp—History of Chemistry, 2 Volumes, (Watts).

Caven—Quantitative Chemical Analysis Part I, **(Blackie).**

Thorp—Inorganic Chemical Preparations, (Ginn).

Reference—

Partington—Text-book of Inorganic Chemistry, (Macmillan).

Lowry—Historical Introduction to Chemistry, (Macmillan).

Taylor—Practical Physical Chemistry, (O. U. P.).

GROUP (ii-B).

Chemistry—

Partington—Text-book of Inorganic Chemistry, (Macmillan).

Mellor—Modern Inorganic Chemistry, (Longmans).

Caven & Lander—Systematic Inorganic Chemistry, (Blackie).

Senter—Outlines of Physical Chemistry, (Methuen).

Taylor—Practical Physical Chemistry, (O. U. P.).

Fenton—Outlines of Chemistry, Part I, (C. U. P.).

Thorp—History of Chemistry, 2 Volumes, (Watts).

Caven—Systematic Qualitative Analysis, (Blackie).

Caven—Quantitative Chemical Analysis, Parts 1 and 2, (Blackie).

Thorp—Inorganic Chemical Preparations, (Ginn).

Cohen—Practical Inorganic Chemistry for Advanced Students (Macmillan).

Weston—Detection of carbon compounds, (Longmans).

Perkin & Kipping—Organic Chemistry, (Chambers).

Moureu—Fundamental Principles of Organic Chemistry, (Bell).

Coward and Perkins—Exercises in Chemical Calculations, (Arnold).

Reference—

Walker—Introduction to Physical Chemistry, (Macmillan).

Russel—Chemistry of Radio-active substances, (Murray).

Lowry—Text-book of Inorganic Chemistry, (Macmillan).

NATURAL SCIENCE

1931

GROUP (iii).

BOTANY

Books for reference—

Coulter: Barnes and Cowles: Text-book of Botany.

Ganong: Text-book of Plant Physiology.

Bower: The Living plant.

Strasburgher: Text-book of Botany.

ZOOLOGY

Main.

Theory—

1. Parker and Haswell: Text-book of Zoology—2 Vols. (Macmillan).
2. Shipley and MacBridge: Text-book of Zoology—2 Vols. (Cambridge University Press).
3. Borradaile: Manual of Zoology (Oxford Univeristy Press.)
4. Bourne (G. G.): Comparative Anatomy of Animals—2 Vols. (George Bell & Sons).
5. Graham Kerr: Evolution (Macmillan).

Practical—

1. Marshall: The Frog. (Macmillan).
2. Marshall and Hurst: Practical Zoology (Smith Elder & Co.).

Reference—

1. Sedgwick (A): Student's Text-book of Zoology—3 Vols. (Swan Sonnenschein).
2. Lang (A): Text-book of Comparative Anatomy—2 Vols. (Macmillan).
3. Weidersheim: Elements of the comparative Anatomy of Vertebrates (Macmillan).
4. Biology of the Frog—Holmes.
5. Borradaile: Animal Life and its Environment (Henry Frowde and Hodder and Stoughton).
6. Reynolds (H.): Vertebrate Skeleton (Cambridge University Press).

Subsidiary

Theory—

1. Shipley and MacBride: Text-book of Zoology (Cambridge University Press).
2. Borradaile: Manual of Zoology (Oxford University Press).
3. Lull: Organic Evolution (Macmillan).
4. Hegner: College Zoology, (Macmillan & Co., New York).

Practical—

1. Marshall: The Frog (Macmillan).
2. Marshall and Hurst: Practical Zoology (Smith Elder & Co.).

PHILOSOPHY

1931

GROUP (iv)

PART II.

Text-books recommended:—

(1) Creighton's 'Introductory Logic' (especially Part III) and "Bosanquet's Essentials of Logic."

(2) R. S. Woodworth's 'Psychology—A study of Mental Life' (Methuen).

(3) Dewey and Tufts: Ethics, Chapter i-v, viii-xx, xxvi.

(4) Philosophical work prescribed: Berkeley's Principles of Human Knowledge.

HISTORY

THE DRAVIDIAN LANGUAGES

GROUP (vi)

Related Subjects.

1931

Early South Indian History, the part prescribed in Chapters I to XVIII of the Syllabus, *vide* Appendix III.

SUBJECTS IN SANSKRIT, ETC., FOR B.A. DEGREE EXAMINATION, 1931.

SANSKRIT

1931

Early History of India to the beginning of the present era (*i.e.*, Christian era).

Books recommended—

E. J. Rapson: Ancient India (Cambridge University Press).

V. A. Smith: Early History of India.

Dr. Macdonell's India's Past.

Marathi

1931

The History of the Marathas upto 1720.

Books recommended—

M. G. Ranade : Rise of the Maratha Power.
Grant Duff : History of the Marathas (Calcutta, 1912)

} New Kitab-Khana, Poona City or Messrs. Parachure Puranick & Co. MadhavaBagh, Bombay.

Oriya

1931

The History of Orissa under Native and Muhammadan Rule.

Book recommended—

W. W. Hunter: Orissa.

Latin

1931

The History of Rome: The Second Century B.C.

French

1931

European History, 1715—1815.

ARABIC AND PERSIAN

1931

The Umayyad Caliphs.

URDU

1931

The Later Three Mughals.

LANGUAGES OTHER THAN ENGLISH

SANSKRIT

1931

GROUP (iv)

Kṛṣṇa-Miśra : Prabōdhacandrōdaya.

Cchāndōgyōpaniṣad—Adhyāya VII.

GROUP (v)

A. A. Macdonell : Vēdic Reader, I to VIII hymns.

Kālidāsa : Raghuvamśa, Cantos IV and VI.

Madhurāvijayam, by Gaṅgādevi, Cantos 1 to 4 (The Agent, Government Sanskrit Publications, Chalai, Trivandrum.

GROUP (vi)

(*a*) A. A. Macdonell : Vēdic Reader, I to VIII hymns.

Aitarēya-brāhmaṇa, VIII, ii, iii, (Nirnaya Sagara Press, Bombay).

Gautama Dharma Sūtra Text only,—Praśna I—Corresponding to Chap : I to IX Bibliotheca Sanskrita (Government Press, Mysore or Anandasrama Press, Poona.)

Cchāndōgyōpaniṣad—Adhyāya VII.

(*b*) Bhavabhûti-Uttararāmacarita

Kṛṣṇa-Miśra : Prabōdhacandrōdaya } (Nirnaya Sagara Press,
Bāṇa : Harṣacarita, Ucchvāsa III } Bombay).

Patañjali : Mahābhāṣya I, i, i.

Mahābhārata, Śāntiparva—Adhyāyas 177 to 182 (Madhva Vilas Book Depót, Kumbakonam).

Nilakaṇṭha Vijaya by Nílakaṇṭha Díksita, Ūcchvāsa I *only* (The Proprietor, Baḷamanorama Press, Mylapore).

(*c*) History of Sanskrit Literature :—

Dr. Macdonell's "History of Sanskrit Literature" and "India's Past" are recommended for study.

RELATED LANGUAGE

Bhavabhūti-Uttararāmacarita.

Raghuvaṁśa. Cantos IV and VI

MARATHI

1931

GROUP (iv).

Poetry—

Rasatarangini by S. V. Pendse, B.A., etc., pages 398—456.

Drama—

Sakuntalá Nátak by Laxman Shastri Lele.

Prose—

Vyákhyáne by Sir N. G. Chandávarkar.

GROUP (v).

The same as for Group (iv).

GROUP (vi).

Poetry—

Rasatarangini by S. V. Pendse, B.A., etc., pages 398—456.

Krishna Vijaya by Moropant : (Uttarárdha) Chapters 50—57.

Drama—

Sakuntalá by Laxman Shastri Lele.

Prose—

Vyákhyáne by Sir N. G. Chandávarkar.

Life of Thorale Shahu Maháráj by M. R. Chitnis.

Nibandha Sangraha—Grantha Dusará—Sri Laxminarayan Press Bombay, pages 1—258.

ORIYA

1931

GROUP (iv)

Kiskindhyā Kānda—Rāmāyana, by Kṛṣna Caran Patnaik (Printing Company, Cuttack).

Mukunda Deb Nātaka, by Godavareesa Misro (Students Stores, Satyabadi).

Prabhāta, by Chandrasēkhara Nanda.
Bhāgavata Ekādasaskandha by Jagannatha Das.
Raghuvamsa (13th Sarga), by Rajakisore Mahanty.
} Trading Company, Cuttack.

GROUP (v)

Kōnārka—Chapters 1 to 7, by Kripasindhu Misra.
History of Gumsur, by Tārini Charan Ratho.
Vidagdha Cintāmani (Canto 78, pp. 215—218), by Abhimanyu Samanta Simhāra.
} Trading Company Cuttack.

GROUP (vi)

Pāncāli Pattapaharana, by Sri Radhamohana Rajendra Deb.
Kōnurkē (Māyādevi, pp. 67 to the end), by Nilakantha Das.
Vidagdha Cintāmani (Canto 78, pp. 215—218), by Abhimanyu Sāmanta Simhāra.
Bhāgavata (Pancama Skandha), by Jagannatha Das.
} Trading Company, Cuttack.

Unmatta Rāghava, by Pandit Gopinath Nanda Sarma (Utkal Sahitya Press, Cuttack).

Kiskindhyā Kānda,—Rāmāyana, by Kṛṣna Caran Patnaik (Printing Company, Cuttack).

Vibidha Prabandha, by Viswanath Kar (Utkal Sahitya Press, Cuttack).

LATIN

1931

GROUP (iv)

Cicero : De Officiis.

GROUP (v)

Tacitus: Agricola and Germania.

GROUP (vi)

The same as for 1931 under Group (v) of the New Regulations (*Vide* page 142)

FRENCH

1931

GROUP (iv)

Ollé-Laprune : De la Certitude Morale (Belin Frères, Paris).

GROUP (v)

A. Vandal : L'Avénement de Bonaparte (Nelson & Co.).

GROUP (vi)

The same as for 1931 under Group (v) of the New Regulations (*Vide* page 143)

ARABIC

1931

GROUP (iv)

Asràrush-Shari 'at-il-Islàmiah.

Jamàlul-'Alum.

Diwàn-i-'Umar b, al-Fàriḍ-First four Qasidas.

GROUP (v)

Tàrikhul-Umamil-Islamiah by Alkhizari.

Al-M' 'arif by Ibni Qutaybah.

Diwani Hassàn b. Thàbit.

GROUP (vi)

Tàrikhu-Âdàbil Lughat-il-' Arabiyyah, Part I

Maqàmàt by Al-Zamakhshari.

Al-Mufaḍḍaliyyàt by Al-Dabbi (1st ten Qasidas).

Jumharatu-Ash 'àril 'àrab,

Related Language—

Tàrikhu-' Adàbil-Lughah.

PERSIAN

1931

GROUP (iv)

Asràri Khudi.

Mathnavi Maulana Rûm, First half Dafter.

Siyàsat Namah.

GROUP (v)

Iràn Nàmeh, Part I excluding old Persian.

Shàh Nàmeh—Sohrab-Rustum—Siyaush and Nushayrawan.

GROUP (vi)

Safar Nàmeh-Nàsir Khusraw.

Siyàhat Nàmeh-i-Ibràhîm Beg, first 100 pages.

Sikandar Nàmeh, first half.

Rumûzi Bay Khudi.

Related Language—

Safar Nàmeh.

URDU

1931

GROUP (iv)

Hikmat-i-' A mali, first 300 pages.

Ma'arijuddin.

Diwan-i-Ghálib.

GROUP (v)

Tárikhud Dawlatayn by Niyàz.

Alfàrūq.

Qasài'-d-i Zauq.

GROUP (vi)

Haqayiq-i-Islam.

Shi'rul Hind, Part I.

Nafhut-Tib.

Kulliyyat-i-Iqbal by Abdul Razzaq.

Zamimah ' Ijaz-i'Ishq.

The following books are recommended for Grammar, etc.—

Qawà'idi-Urdu by Abdul Haq.

Tashīlul-Balàghat.

(All the books are available at Islamiah Book Depot, Kurnool.)

TAMIL

1931

GROUPS (iv) AND (v)

Selections published by the University:—

Part I.

Purananuru, Stanzas 63—312 (pp. 111—126).

Thirukkural :—

Payanilacollamai.

Thivinaiyacham.

Oppuravarital.

Egai.
Pugal.
Amaichchu.
Cholvanmai.
Vinaittuimai.
Vinaithittpam.
Mannaraichernthozhugal.

Part II.—Kambaramayanam—Aranyakandam.

Prose—

Appar Charitram—K. Subrahmanya Pillai, M.A., M.L., Saiva Siddhanta Publishing Co., Madras.

Nakkerar—N. M. Venkataswami Nattar, Bishop Heber College, Trichinopoly.

GROUP (vi).

Poetry—

Same as for Groups (iv) and (v) with the following additions.

Perumpanattruppadai, pp. 2-20.

Manimagalai, pp. 301-322.

Kalithogai-Kurinchikali,—E. V. Anantarama Ayyar, 16, Nagapier Street, Tiruvateswaranpet, Madras.

Prose—

Cholankarikalan—Ulaganatha Pillai, Sanskrit College, Tiruvadi.

Kambar—T. Chelvakesavaraya Mudaliar, Perambore.

Sri Manikkavasakar—C. K. Subrahmanya Mudaliyar, B.A., B.L., Coimbatore.

Grammar—

Nannul (Sankara Namasivayarurai) Collathigaram by Mahamahopadhyaya V. Swaminatha Ayyar, Tyagaraja Vilas, Thiruvateesvaranpet, Madras.

TELUGU

1931

GROUP (iv).

Advaitamruta Saramu by Sreshtaluri Krishnaswamiah.

GROUP (v).

i. Andhrula Charitramu by Ch. Veerabhadra Rao, Part II page 1 to 116.

ii. Andhra Veerulu by M. Somasekhara Sarma, Prakaranams 1 and 2.

iii. Lakshmana Raya Vyasavali by K. V. Lakshmana Rao. Select Essays bearing on historical topics only.

iv. Prajaswamika Prabhutvamu by Prof. Narasimham.

v. Address on Andhra History and Awakening by the Hon'ble V. Ramadas Pantulu, (published by V. Ramaswamy Sastrulu & Sons).

GROUP (vi).

The same as for 1931 under Part III, Group (v) of the New Regulations. (*Vide* pages 148—149).

KANARESE

1931.

Groups (iv) & (v).

(i) Selections published by the University—Volume II, Chandraprabha Purana (pp. 103 to 146).

(ii) Ramashwamedha (modernized), Part I, by M. Shankara Bhatta (Bala Sahitya Mandala, Mangalore).

(iii) Viddyullata by N. Tirumalamma (Sati Hitaishini Granthamala Office, Nanjangud).

(iv) Sakuntala Nataka by Basappa Sastri (M. S. Rao & Co., Avenue Road, Bangalore City).

(v) Kavi Charitre by Rao Bahadur R. Narasimhachar, M.A., Volume II, Introduction and Poets of the 16th Century (Author, Malleshwaram, Bangalore).

GROUP (vi)

(i) All the books prescribed for groups (iv & v).

(ii) Sasana Padayamanjari by Rao Bahadur R. Narasimhachar, M.A., (Malleshwaram, Bangalore).

(iii) Apratima vira charite by Tirumalarya (Kavya Kalanidhi Office, Mysore).

(iv) Sringara Ratnakara by Kavi Kama (Kavya Kalanidhi Office, Mysore).

(v) Sabdamani Darpana by Kesiraja (B. E. M. Book Depot, Mangalore).

(vi) Chhandassu by Nagavarma (B. E. M. Book Depot, Mangalore).

(vii) Primrosa Vijaya by S. G. Govindaraja Ayyangar (M. S. Rao & Co., Avenue Road, Bangalore).

MALAYALAM

1931

GROUPS (iv) AND (v)

Poetry—

1. Bhishma Parvam—Maha Bharatam by Ezhuthachan—Selections published by the University (B.A.), Part I, Vol. II.

2. Kirmmeeravadham—Kathakali by Kottayath Thampuran.
3. Umakeralam—7 and 8 Sargams. By Ullur S. Parameswara Ayyar, M.A. (B.V. Book Depot, Trivandrum).

Drama—

Uthara Rama Charitham by C. Chathukutty Mannadiar (Saraswati Vilasam Book Depot, Trichur).

Prose—

1. Marthanda Varma by C. V. Raman Pillai, B.A., (B.V. Book Depot, Trivandrum).
2. Sarada—Part I by O. Chandu Menon (Published by K. Madhava Menon, B.A., B.L., Vakil, Chalapuram, Calicut).

GROUP (vi).

The same texts as those for Groups (iv) and (v) together with the following additional books:—

1. Ramacharitam—5 to 9 Patalams, both inclusive (B. V. Book Depot, Trivandrum).
2. Kannassa Ramayanam—Balakandam. (The edition published by K. Parameswaran Pillai, M.A., Nantiyar Veetu, Thampanoor, Trivandrum).
3. Krishnagatha—Soubhadrika Katha (Mangalodayam Press, Trichur).

TEXT-BOOKS FOR 1932.

ENGLISH

PART I.

1932.

*Shakespeare: Much Ado about Nothing; King Lear.

Plays for General Reading.

Romeo and Juliet.

Coriolanus.

Winter's Tale.

Modern Poetry:

Milton: Paradise Lost, Book II,

and the following selections in Pattern Poetry III (Nelson):—

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*Under Shakespeare, the Old Regulation and the Transitory Regulation candidates will study only the †three plays prescribed under the New Regulations and not the life and work of the author as under old Regulations.

The question papers will be common to all candidates in Shakespeare and Modern Poetry, and the papers in Prose and Composition will be different.

Pope: The Rape of the Lock;
Wordsworth: Tintern Abbey;
Shelley: Adonais;
Browning: Andrea Del Sarto.

17th and 18th Century Prose:—

†Johnson: Prose Selections in Johnson; Prose and Poetry. (Clarandon Series).

Burke: Selections, edited by A.M.D. Hughes. **(Oxford University Press).**

19th Century Prose:—

Newman's Literary Selections **(Longmans, Green & Co.)**

Arnold: Selections: edited by H. W. Rawlinson. **(Macmillan & Co.).**

Pater: Selections: edited by H. W. Rawlinson. **(Macmillan & Co.).**

or

Lamb's Essays of Elia, First Series, edited by A. H. Thompson.

Non-detailed Study:—

*Scott: Bride of Lammermoor.
*George Eliot: Romola.
*Meredith: Evan Harrington.

PHYSICS.

The same as for 1932 under the New Regulations.

CHEMISTRY.

The same as for 1932 under the New Regulations.

BOTANY.

The same as for 1932 under the New Regulations.

ZOOLOGY

The same as for 1932 under the New Regulations.

PHILOSOPHY.

Logic, Psychology, Ethics } The same as for 1931.

Philosophical work prescribed:—

Hume's Enquiry concerning Human Understanding.

Note.—†Candidates are required to show a knowledge of the introductory essays.

**Vide* footnote on page 409.

SANSKRIT.

(Main and Subsidiary.)

The same as for 1931.

MARATHI.

The same as for 1931.

ORIYA.

The same as for 1931.

Related Subjects.

The same as those for 1932 under the New Regulations. (*Vide* page 154).

LATIN.

Group (iv).

Cicero: De Officiis.

Group (v).

Tacitus: Agricola and Germania.

Group (vi).

Cicero: De Officiis.
Tacitus: Agricola and Germania.
Virgil: Aeneid II.
Horace: Odes III, 1-20.
Juvenal: Satires VII and X.
Livy: History V.

FRENCH.

Group (iv)—La Bruyére : Les Caractéres.
" (v)—De Tocqueville : L'Ancien Régime.
" (vi)—La Bruyére : Les Caractéres.
De Tocqueville : L'Ancien Régime.
Corneille : Le Cid.
Moliére : Le Malade Imaginaire.
Faguet : Ce que disent les Livres.
Hémond : Maria Chapdelaine.
The Oxford Book of French Verse.

ARABIC.

Groups (iv) and (v).

The same as for 1931.

Group (vi).

The same as for 1932 under the New Regulations for Part III—Group (v).

PERSIAN.

Groups (iv) and (v).

The same as for 1931.

Group (vi).

The same as for 1932 under the New Regulations f Part III—Group (v).

URDU.

GROUPS (iv) AND (v).

The same as for 1931.

GROUP (vi).

The same as for 1932 under the New Regulations for Part III—Group (v).

TAMIL.

GROUPS (iv) AND (v).

The same as for 1931.

GROUP (vi).

The same as for 1932 under the New Regulations for Part III—Group (v).

TELUGU.

The same as for 1931.

KANARESE.

The same as for 1931.

MALAYALAM.

The same as for 1931.

TEXT BOOKS FOR 1933

ENGLISH.

1933

Prose—

**Shakespeare.—*

King Lear.

A Midsummer Night's Dream.

Plays for General Reading:—

Richard II.

Antony and Cleopatra.

The Tempest.

Poetry —

Paradise Lost. Book II.

The Rape of the Lock.

The following Selections from "Longer Poems of the Nineteenth Century", 1st Series (Blackie).

Wordsworth: Ode on Intimations of Immortality.

Byron: Rome (from Childe Harold—Canto 4).

Shelley: The Sensitive Plant.

*Under Shakespeare, the Old Regulation and the Transitory Regulation candidates will study only the †three plays prescribed under the New Regulations and not the life and work of the author as under old Regulations.

The question papers will be common to all candidates in Shakespeare and Modern Poetry, and the papers in Prose and Composition will be different.

17th and 18th Century Prose.—

Burke, Selections; edited by A. M. D. Hughes (Clarendon Press).

Johnson's Preface to Shakespeare (obtainable in the Oxford Miscellany Series, Oxford University Press).

Johnson's Life of Pope.

19th Century Prose.

Carlyle's Essays on Burns and Johnson (Blackie).

Pater: Selections: edited by Rawlinson (Macmillan & Co.).

or

Ruskin: Unto this Last.

Non-detailed Study.—

*Pride and Prejudice.
*Great Expectations.
*The English Voyages of the 16th Century, Raleigh (Agents—Macmillan and Co., Ltd., Mount Road, Madras.)

PHYSICS.

Main and Subsidiary.

The same as for B.A.—(New)—Main and Subsidiary 1933.

CHEMISTRY.

Main.

The same as those for B.A. (New), 1933.

Subsidiary.

The same as for 1932.

BOTANY.

The same as for 1932.

ZOOLOGY.

The same as for B.A. (New), 1933.

PHILOSOPHY.

(1), (2) and (3) The same as for 1932.

(4) Philosophical work prescribed:—

The Meditations of Descartes.

SANSKRIT.

The same as for 1932.

MARATHI.

The same as for 1932.

ORIYA.

The same as for 1932.

LATIN.

The same as for 1932.

FRENCH.

The same as for 1932.

TAMIL.

The same as for 1932.

*Vide footnote on page 409.

TELUGU.

GROUPS (iv) & (vi).

The same as for 1932.

GROUP (v).

Angleya Rajyanga Nirmana Carita by Gottetti Kanakarazu Pantulu.

KANARESE.

The same as for 1932.

MALAYALAM.

The same as for 1932.

FORMS OF ANNUAL CERTIFICATE.

I certify that..........has kept three-fourths of the attendances prescribed by the............College..............in the course of instruction in..........during the year consisting of the following terms:—1..........2..........3..........and that his conduct and progress have been satisfactory.

...............19 . **Principal.**

I certify that..........has kept three-fourths of the attendances prescribed by the..........College..........in the course of instruction in............during the year consisting of the following terms:—1............2...........3............., that his conduct and progress have been satisfactory and that he has completed the course of study prescribed for the B.A. Degree Examination.

...............19 . *Principal.*

**I certify that..........has attended the course of practical instruction in........for the B.A. Degree Examination at the ....during the year consisting of the following terms:— 1............2............3..........*

...............19 . *Professor or Lecturer.*

**I certify that..........has attended the course of practical instruction in..........for the B.A. Degree Examination at the ....during the year consisting of the following terms:— 1..........2..........3.......... and that he has satisfactorily completed the course.*

...............19 . *Professor or Lecturer.*

*These certificates have to be produced only by candidates in Groups (i), (ii) & (iii).

* TIME-TABLES

B.A. DEGREE EXAMINATION

ENGLISH LANGUAGE AND LITERATURE

Days	Hours	Subjects	Marks
First day ...	10—1	Shakespeare	75
Second day...	10—1	Modern Poetry	75
Third day ...	10—1	Composition	90
Fourth day...	10-12-30	Seventeenth and Eighteenth Century Prose	60
Fifth day ...	10-12-30	Nineteenth Century Prose ...	60
		Total ...	360

OPTIONAL GROUPS.

(i) MATHEMATICS

Days	Hours	Subjects	Marks
Seventh day	10—1	Geometry	90
Eighth day...	10—12	Dynamics	70
	2— 4	Astronomy	80

*Subject to alteration.

OPTIONAL GROUPS—*contd.*

(i) MATHEMATICS—*contd.*

Days	Hours	Subjects	Marks
Ninth day ...	10—12	Calculus	70
Tenth day ...	10—1	Hydrostatics, Properties of Matter and Heat	100
Eleventh day	10—1	Algebra and Trigonometry ...	90
		Total ...	500

(ii-A) PHYSICAL SCIENCE.

Days	Hours	Subjects	Marks
Seventh day..	10-12-30	Dynamics and Hydrostatics ...	60
Eighth day ..	10-12-30	Properties of Matter and Heat ...	60
Ninth day ...	10—1	Light, Electricity and Sound ...	100
Eleventh day	10—1	Chemistry	90
Dates and hours of Practical Examinations will be notified later.		Practical Examination in Chemistry ...	90
		Practical Examination in Physics ...	100
		Total ...	500

(ii-B) PHYSICAL SCIENCE*

Days	Hours	Subjects	Marks
Seventh day.	10—1	Physics	90
Eighth day...	10—1	General Chemistry	70
Ninth day ...	10—1	Inorganic Chemistry	70
Tenth day ...	10—1	Chemistry of Carbon Compounds ...	80
Dates and hours of Practical Examinations will be notified later.		Practical Examination in Physics ...	90
		Practical Examination in Chemistry ...	100
		Total ...	500

(iii) NATURAL SCIENCE.

(*A*) *Botany*.

Days	Hours	Subjects	Marks
Seventh day.	10—1	Written Examination in Main subject I ...	80
Eighth day...	10—1	Do. Do. II ...	80
Tenth day	10—12	Do. Subsidiary I ...	60
	2—4	Do. Do. II ...	60
Dates and hours of Practical Examinations will be notified later.		Practical Examination in Main Subject I.	60
		Do. Do. II	60
		Collection	20
		Practical Note books	20
		Practical Examination in the Subsidiary Subject	60
		Total ...	500

(iii) NATURAL SCIENCE

(B) Zoology.

Days.	Hours.	Subjects.	Marks.
Seventh Day	10—1	Written Examination in Zoology (Main-I) Invertebrata ...	80
Eighth Day.	10— 1	Written Examination in Zoology (Main-II) Chordata ...	80
Tenth Day...	10—12	Written Examination in Zoology (Subsidiary-I) Invertebrata ...	60
	2— 4	Written Examination in Zoology (Subsidiary-II) Chordata ...	60
Dates and hours of Practical Examinations will be notified later.		Practical Examination in Main Subject I ...	80
		Do. do. do. II ...	80
		Do. in Subsidiary Subject ...	60
		Total ...	500

(C) Geology.

Days	Hours	Subjects	Marks
Seventh day.	10—1	Written Examination in Main Subject I.	75
Eighth day...	10—1	Do. in Main Subject II ...	75
Tenth day	10—1	Written Examination in Subsidiary Subject I	60
	2—4	Do. do. II	60

NATURAL SCIENCE—*contd.*
(*C*) *Geology*—contd.

Dates and hours of Practical Examinations will be notified later.	Practical Examination in Main Subject I	60
	Do. do. II	60
	Notes on field work with Specimens ...	20
	Laboratory or practical note-books ...	20
	Library Note-books	10
	Practical Examination in Subsidiary Subject	60
	Total ...	500

D. Physiology.
(*Main*)

Days	Hours	Subjects.	Marks
Seventh day	10—1	Written Examination in Main Subject I	80
Eighth day...	10—1	Do. do II	80
Tenth day	10—12 2—4	Written Examination Subsidiary I Do do. II	60 60
Dates and hours of Practical Examinations will be notified later.		Practical Examination in Main Subject I	80
		Do do. II	80
		Do. do. Subsidiary	60
		Total ...	500

(iv) PSYCHOLOGY, ETHICS AND LOGIC OR A LANGUAGE

Seventh day	10—1	Logic and Theory of Knowledge *or* a Language	100
Eighth day...	10—1	Special Subject	100
Ninth day	10—12 2—4	Psychology I ... ... Do. II	75 75
Tenth day.	10—12 2—4	Ethics I ... ... Do. II	75 75
		Total ...	500

(v) HISTORY AND ECONOMICS

A.

Days	Hours	Subjects	Marks
Seventh day.	10—1	Political Science or a Language ...	100
Eighth day ...	10—1	General Indian History	100
Ninth day.	10—1	Constitutional History of Great Britain and Ireland ...	100
Tenth day ...	10—1	Outlines of European History ...	100
Eleventh day	10—1	Economic—General ...	100
		Total ...	500

B.

Seventh day	10—1	Modern History ...	100
Eighth day	10—1	General Indian History ...	100
Ninth day ...	10—1	Economics—Special I	100
Tenth day ...	10—1	Economics—Special II ...	100
Eleventh day	10—1	Economics—General ...	100
		Total ...	500

(vi) Languages other than English

(1) *Sanskrit and Early Indian History*

Days	Hours	Subjects	Marks
Seventh day	10—1	Books of the Early Period ...	80
Eighth day.	10—1	Books of the Later Period ...	80
Ninth day ...	10—1	Books of the Later Period ...	80
Tenth day ...	10—1	Grammar ...	80
Eleventh day	10—1	History of Sanskrit Literature ...	80
Twelfth day.	10—1	Early Indian History .	100
		Total ...	500

(2) *Urdu and Indian History—Muslim Period, or Arabic or Persian*

Seventh day.	10—1	Prose books ..	80
Eighth day	10—1	Poetry ..	80
Ninth day ...	10—1	Translation ...	80
Tenth day ...	10—1	Grammar, including Rhetoric and Prosody ...	80
Eleventh day	10—1	History of Language and History of Literature ...	80
Twelfth day.	10—1	Indian History—Muslim Period *or* Arabic or Persian ...	100
		Total ...	500

(3) *Arabic or Persian, and Early Muslim History*

Seventh day.	10—1	Prose books ...	80
Eighth day .	10—1	Poetry ...	80
Ninth day ...	10—1	Translation ...	80
Tenth day ...	10—1	Grammar, including Rhetoric and Prosody ...	80
Eleventh day	10—1	History of Arabic *or* Persian Language and Literature	80
Twelfth ...	10—1	Early Muslim History ...	100
		Total ...	500

(4) *A Dravidian Language or Oriya or Marathi, and a Related Subject or Sanskrit*

Days	Hours	Subjects	Marks
Seventh day	10—1	Set books and History of Literature I ...	80
Eighth day...	10—1	Do. do. II ...	80
Ninth day ...	10—1	History of Language and Grammar ...	80
Tenth day ...	10—1	Comparative Grammar—Dravidian or Gaudian	80
Eleventh day	10—1	Composition	80
Twelfth day.	10—1	Related Subject or Sanskrit	100
		Total ...	500

(5) *Greek or Latin*

Days	Hours	Subjects	Marks
Seventh day.	10—1	Set books and History of Literature ...	80
Eighth day...	10—1	Do. do. ...	80
Ninth day ...	10—1	Prose Composition	80
Tenth day ...	10—1	Translation of unprepared passages ...	80
Eleventh day.	10—1	Grammar	80
Twelfth day.	10—1	Greek or Roman History	100
		Total ...	500

(6) *French or German*

Days	Hours	Subjects	Marks
Seventh day.	10—1	Set books and History of Literature ...	80
Eighth day...	10—1	Do. do. ...	80
Ninth day ...	10—1	History of the Language	80
Tenth day ...	10—1	Composition	80
Eleventh day.	10—1	Translation	80
Twelfth day.	10—1	European History	100
		Total ...	500

(7) *Hebrew and History of the Jews*

Seventh day.	10—1	Set books	80
Eighth day...	10—1	Do.	80
Ninth day ...	10—1	Translation	80
Tenth day ...	10—1	Grammar	80
Eleventh day.	10—1	History of Language and Literature ...	80
Twelfth day.	10—1	History of the Jews	100
		Total ...	500

B.A. Degree Examination

(i) English Language and Literature

Register Number	English 360	Whether passed or not passed	If passed, in what class ranked	Remarks

Register Number

Optional Group

Marks	Subject	Group	Number of marks obtained
250	Pure Mathematics	Group i	
250	Applied Mathematics		
500	Total		
220	Main Subject	Group ii	
100	Practical examination in Main Subject		
180	Subsidiary Subject		
500	Total		
160	Main Subject	Group iii-a Botany.	
160	Practical examination in Main Subject		
180	Subsidiary Subject		
500	Total		
160	Main Subject	Group iii-b Zoology.	
160	Practical examination in Main Subject		
180	Subsidiary Subject		
500	Total		
150	Main Subject-Written	Group iii-c Geology	
17[illegible]	Practical Examination in Main Subject		
180	Subsidiary Subject		
500	Total		
160	Main Subject	Group iii-d Human Physiology	
160	Practical Examination in Main Subject		
180	Subsidiary Subject		
500	Total		
250	Psychology and Special Subject	Group iv	
250	Ethics and Logic or a Language		
500	Total		
300	Indian, European, and Constitutional History	Group v-A	
200	Economics and Political Science or a Language		
500	Total		
300	Economics	Group v-B	
200	History		
500	Total		
400	Selected Language	Group vi	
100	Related Subject or Language		
500	Total		

(ii) OPTIONAL GROUPS

iii

B. A.

Name	English	
	Vernacular	
Age and date of birth		
Name and occupation of father or guardian		
Race (*i.e*, nation, tribe, etc.)	Religion	
Address		
Date of passing the Intermediate Examination in Arts & Science		
College or colleges at which candidate has studied for the examination and time at each.		
The Part or Parts (both Parts, or Part I, or Part II) for which the candidate is appearing		
Group selected under Part II and optional subjects, if any, selected under that Group. (If Group (iii), state main and subsidiary subjects; if Group (iv) or Group (v), state whether a language is taken and, if so, specify the language; if Group (vi), state the language and the related subject or language)		

If the candidate has already passed in either Part, the year of passing, register number and the class taken should be stated	Part I			Part II		
	Year	Reg. No.	Class	Year	Reg. No.	Class

*Year or years, if any, in which the candidate has already appeared for the examination, and the place of examination in each year, with the register number	Part I			Part II		
	Year	Reg. No.	Centre	Year	Reg. No.	Centre

Signature of the Principal of the college in which candidate is attending at date of application.

Date.................. *Signature of candidate*...

* This column is not intended for candidates appeairng for the first time.

iv

B.A. UNDER THE TRANSITORY REGULATIONS

PART I—ENGLISH LANGUAGE AND LITERATURE

Name	English			
	Vernacular			
Age and date of birth				
Name and occupation of father or guardian				
Race (*i.e.*, nation, tribe, etc.)			Religion	
Address				
Date of passing the First Examination in Arts				
Whether the candidate has already passed in Part II *or* its equivalent under the Old By-laws. If so, the Group or Branch, year of passing, register number, and the class taken				
Whether the candidate has already passed the Second Language division under the Old By-laws, *or* its equivalent under the Transitory Regulations; if so, specify the language, year of passing, register number and the class taken				
Year or years, if any, in which the candidate has already appeared under the Transitory Regulations for the examination and the place of examination in each year				
Present position or occupation				

B.A. UNDER THE TRANSITORY REGULATIONS

PART II—OPTIONAL GROUP (vi)—LANGUAGES OTHER THAN ENGLISH

Name	English			
	Vernacular			
Age and date of birth				
Name and occupation of father or guardian				
Race (*i.e.*, nation, tribe, etc.)			Religion	
Address				
Date of passing the First Examination in Arts				
Language selected				
Whether the candidate has already passed in Part I or its equivalent under the Old By-laws. If so, year of passing, register number, and the class taken				
Whether the candidate has already passed the Science Division of the Examination under the Old By-laws *or* its equivalent under the New Regulations. If so, the Branch or Group, year of passing, register number and the class taken				
Year or years, if any, in which the candidate has already appeared under the Transitory Regulations for the examination and the place of examination in each year				
Present position or occupation				

B.A. UNDER THE TRANSITORY REGULATIONS

PART II—OPTIONAL GROUP *other than* GROUP (vi)

Name	English			
	Vernacular			
Age and date of birth				
Name and occupation of father or guardian				
Race (*i.e.*, nation, tribe, etc.)			Religion	
Address				
Date of passing the First Examination in Arts				
Group and optional subjects, if any, selected under that Group. If Group (iii), state main and subsidiary subjects, If Group (iv) or Group (v), state whether a language is taken and, if so, specify the language.				
Whether the candidate has already passed in Part I or its equivalent under the Old By-laws. If so, year of passing, register number, and the class taken				
Whether the candidate has already passed the Second Language Division of the B.A. Degree Examination under the Old By-laws, or its equivalent under the Transitory Regulations. If so, specify the language, year of passing, register number and the class taken				
Year or years, if any, in which the candidate has already appeared under the Transitory Regulations for the examination and the place of examination in each year				
Present position or occupation				

APPENDIX XVI.

DEGREE OF BACHELOR OF ARTS (HONOURS.)*

Regulations in force prior to 1931, which will be in force for the Examinations of 1932 and 1933.

A. Courses of Study.

Courses of study

1. For the B.A. (Honours) degree the course shall extend over a period of not less than three years, each consisting of three terms ordinarily consecutive, and shall comprise instruction in:—

I. English during the first year (preliminary Examination).

II. One of the following branches of knowledge during the three years:—

i. Mathematics.

ii. Philosophy.

iii. History, Economics and Politics.

iv. Two languages, other than English one being a classical language already studied in the Intermediate course; provided however that this restriction shall not apply if one of the two languages selected is Sanskrit and the other an Indian Vernacular.

v. English Language and Literature.

vi. Sanskrit Language and Literature.

vii. Arabic Language and Literature.

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*For the regulations relating to the courses of study and examinations in Physical and Natural Sciences for the B.A. (Honours) Degree Examination, which remain in force till the year in which the first examination is held for the Degree of Bachelor of Science (Honours) in the corresponding Branches ii to vi. *see* Appendix XVII. The numbering of the Branches shall, till then, continue for purposes of examination to remain the same as in the Calendar of 1918.

B. Examinations.

Examinations

2. (*a*) No candidate shall be eligible for the B.A. (Honours) degree until he has passed an examination in one of the branches of knowledge contained in the courses of study.

(*b*) No candidate, other than those hereafter exempted, shall be admitted to the final examination in Honours unless he has passed a preliminary examination.

Preliminary Examination

This preliminary examination shall be, in the case of candidates, other than those who have selected Branch v of the Honours course, the examination in English for the B.A. degree in (1) Composition, (2) Nineteenth Century Prose. In the case of candidates, who have selected Branch v the preliminary examination shall be in (1) Composition as above, (2) The History of England treated in relation to the History of English Language and Literature.

There shall be one paper in English History which shall consist exclusively of subjects for short essays, and of these the paper shall contain a larger number than the candidate is permitted to attempt.

Marks qualifying for a pass

A candidate shall be declared to have passed the preliminary examination if he obtains not less than forty per cent. of the total marks in the two papers taken together. All other candidates shall be deemed to have failed in the examination. Successful candidates obtaining not less than sixty per cent. of the total marks shall be declared to have passed with distinction.

Admission to Preliminary Examination

(*c*) No candidate shall be admitted to the preliminary examination unless he has passed the Intermediate Examination in Arts and Science in this University or an examination in some other University recognized by the Syndicate as equivalent thereto.

B.A.'s should undergo 2 years' course at college

3. A candidate for the B.A. (Honours) degree who has passed the B.A. Degree Examination shall be permitted to appear for the B.A. (Honours) Degree Examination after a two years' course in a constituent or an

affiliated college provided he has passed the B. A. Degree Examination in the subjects for which he desires to appear. He shall be exempted from passing the preliminary examination.

Time limit for appearance at Final Examination

4. A candidate for the B.A. (Honours) degree shall appear for the final examination in Honours not later than the end of the fourth year after he has passed the Intermediate Examination or not later than the month of March following the end of the fourth year in the case of candidates declared to have passed in September.

Permitted to appear only once

5. No candidate shall be permitted to undergo the complete final examination in Honours more than once.

Candidates for Honours recommended for B.A. degree

6. In the event of a candidate for the B.A. (Honours) degree failing to satisfy the Examiners he may be recommended by them for the B.A. degree provided that he obtains not less than $33\frac{1}{3}$ per cent. of the total marks and not less than twenty-five per cent. in each division of examination.

7. A candidate qualifying for the B.A. Degree under the preceding Regulation of this Chapter shall be permitted to appear for the M.A. Degree Examination in the same subject in any subsequent year without the production of further certificates of attendance.

Candidates failing in Honours may appear for B.A. privately

8. A candidate not already eligible for the B.A. degree, who, having failed completely in the B.A. (Honours) Degree Examination, desires to appear for the B.A. Degree Examination, shall be allowed to do so without the production of a further certificate of attendance in an affiliated college.

Subjects for examination

9. The courses in each Optional Branch of knowledge shall be as follows :—

(i) *Mathematics.*

A candidate shall be required to have a sound knowledge of—

i. Mathematics

(*a*) Pure Mathematics:

1. Pure Geometry including Projective Geometry.
2. Algebra and Theory of Equations.
3. Plane Trigonometry.
4. Differential and Integral Calculus including Reimann integration, Cauchy's theorem on Contour integration and Fourier's series.
5. Elementary Differential Equations.
6. Co-ordinate Geometry of two dimensions.
7. Solid Geometry—the line, plane, sphere and surfaces of the second degree.

(b) Applied Mathematics.

1. Statics excluding the theory of potentials.
2. Dynamics of a Particle.
3. Dynamics of a Rigid Body—motion in two dimensions.
4. Hydrostatics.
5. Astronomy, General and elementary spherical.

(*c*) Two of the following subjects at the option of the candidate :—

1. Geometry	...	A special subject.
2. Algebra	...	do.
3. General Theory of Functions.	...	do.
4. Differential Equations		do.
5. Special Functions	...	do.

A candidate shall give notice through his college, a year before the date of the examination of the particular subjects he proposes to take.

Three papers shall be set in Pure Mathematics, three in Applied, and one in each of the optional subjects selected. Each paper shall be of three hours' duration and shall contain questions on the principles developed in the ordinary treatment of the subject as well as exercise of moderate difficulty arising therefrom.

(ii) *Philosophy*

A candidate shall be examined in—

ii. Mental and Moral Science

(1) Logic and Theory of knowledge, according to a syllabus.

(2) Either Psychology or Ethics, as the candidate may select, according to a syllabus *provided* that a candidate selecting Psychology must have attended, and made satisfactory progress under a course of instruction in Ethics equivalent to that required of candidates for the B.A. degree, and that a candidate selecting Ethics must have attended, and made satisfactory progress under a course of instruction in Psychology equivalent to that required of candidates for the B.A. degree.

(3) Outlines of European Philosophy according to a syllabus.

(4) Outlines of Indian Philosophy according to a syllabus.

(5) A prescribed modern work dealing constructively with the general problems of Philosophy.

(6) One of the following, according to the candidate's option:—

(a) One of the following schools of Indian Philosophy, to be studied historically and critically—

Adwaita Vedanta.	Sankhya.
Saiva Siddhanta.	Buddhism.
Visistadwaita.	Jainism.
Dwaita	

(*b*) A prescribed period of Ancient European Philosophy.

(*c*) A prescribed period of Modern European Philosophy.

(*d*) Political Philosophy.

(*e*) The Philosophy of Religion.

(*f*) Experimental Psychology.

The examination shall be conducted by means of written papers and an essay, with the addition, in the case of Experimental Psychology, of a practical examination.

A candidate shall give notice through his college, a year before the date of the examination, of the particular subjects he proposes to take.

(iii) *History, Economics and Politics.*

A candidate shall offer himself for examination in—

Either A.

iii. History, Economics and Politics

1. The History of India.
2. Constitutional History of Great Britain and Ireland.
3. Politics.
4. Economics.
5. A special subject } to be selected from a list
6. A special subject } prescribed from time to time

or B

(1) Economics I
(2) Economics II
(3) Politics
(4) Indian History, according to a syllabus

} a general survey of an advanced character.

(5) A special subject } to be selected from a list prescribed from time to time.
(6) A special subject }

He shall further be required to write an essay.

A candidate shall give notice through his college, a year before the date of the examination of the particular papers he proposes to take.

(iv) *Two Languages other than English.*

iv Two Languages other than English

The course in each language, the text-books prescribed and the examination therein shall be identical with those prescribed for the same language when offered as the selected language in Group (vi) of the B.A. Pass Course, the related subjects and languages being excluded ; provided that in the examination in each language in Branch iv (Honours) there shall be an additional paper of three hours' duration in Composition, and provided that a candidate for the B.A. (Honours) Degree in Branch iv who has passed the B.A. Degree Examination in Group (vi) shall be exempted from examination in his selected language of the B.A. Degree Examination, except in respect of the additional paper in Composition specially prescribed for Branch iv in this Regulation, and he shall be credited with the percentage of marks which he obtained in that language in the B.A. Degree Examination.

In cases where there is already provision for a paper in Composition under Group (vi) of the B.A. Pass Course, the additional paper in Composition under Branch iv (Honours) shall have special reference to certain set books of an advanced character that may be prescribed from time to time by the respective Boards of Studies concerned.

A candidate shall give notice through his college at least a year before the date of the examination of the languages in which he proposes to appear.

(v) *English Language and Literature.*

V. English Language and Literature.

There shall be both a written and a *Viva-voce* Examination. The written examination shall consist of three divisions. There shall be three papers in division (a), five papers in division (b), and two papers in division (c).

(a) The History of the English Language: Old and Middle English.

The History of the English Language shall include phonology, accidence and Syntax, also Germanic Philology so far as it bears on the English language. In Old and Middle English there shall be prescribed certain select texts. Ability to translate passages from Old and Middle English texts not prescribed shall be tested.

(b) The History of English Literature; Shakespeare; Modern English.

A candidate shall be required to show a knowledge of the whole course of the history of English literature. In Shakespeare a candidate, shall, in addition to the detailed study of the prescribed plays be required to show a general knowledge of Shakespeare's works and of Shakespearean criticism. In modern English there shall be a number of set books in prose and poetry of the 15th, 16th, 17th, 18th and 19th centuries. A candidate shall be required to make a detailed study of the texts, marked with an asterisk and to show a general knowledge of the other prescribed texts.

(c) Special Period or subject.

A candidate shall be required to offer for examination a special period or subject selected by him from the following list :—

1. Literature of the 14th and 15th Centuries.
2. Elizabethan Literature (i.e., 1558-1637).
3. The Age of Milton and Dryden.
4. The Age of Pope and Johnson.

5. Wordsworth and his contemporaries.

6. Tennyson and his contemporaries.

A candidate shall be required to show a knowledge of the writings of the chief authors of the period selected. He shall also be examined on certain set books of the period selected.

7. Indo-Germanic Philology with special reference to Sanskrit.

8. Indo-Germanic Philology with special reference to Gothic.

A candidate selecting (7) shall be examined in certain set books in Sanskrit. A candidate offering (8) shall be examined in select Extracts of the literary remains of Gothic.

Books or groups of books set shall ordinarily continue the same for not less than five years. A candidate shall give notice through his college at least a year before the date of the Examination of the books or groups of books which he proposes to offer.

The *Viva voce* Examination shall be held as soon as possible after the Examiners have read the written answers of the candidates. No fixed proportion of marks shall be assigned to it: its purpose is to assist the examiners in placing the candidates.

(vi) *Sanskrit Language and Literature.*

Courses of Study—

vi. Sanskrit Language and Literature

1. Every candidate, who presents himself for this branch of the Honours B. A. Examination, shall be required to possess a sound knowledge of the principles of comparative philology and of the elements of comparative grammar with special reference to the important Indo-Germanic languages.

2. The course of studies shall further consist of one partfitted to equip the student with a general knowledge of the Sanskrit language and literature, and also of

another part fitted to enable him to acquire a special knowledge of any specified branch or branches of that literature as prescribed from time to time.

3. The course in the general part shall comprise—

(1) The history of the language ;

(2) The history of the literature in the language;

(3) Grammar, prosody, and poetics ;

(4) Prescribed text-books in poetry and prose, the selections being fairly representative of the various stages in the life of the Sanskrit language and literature ;

(5) Translation from Sanskrit into English and from English into Sanskrit.

4. The course in the special part shall comprise—

(1) Prescribed text-books selected from any specified branch or branches of Sanskrit literature ;

(2) A critical and comparative enquiry into the contents and value of the specified branch or branches of the literature taken up for study by the candidate.

Examination—

1. There shall be a paper on the principles of comparative philology and the elements of Indo-Germanic comparative grammer.

2. In addition to this there shall be in the general part—

(1) One paper on the history of the Sanskrit language and literature ;

(2) One paper on grammar, prosody and poetics ;

(3) One paper on the prescribed text-books, in which also there shall be questions on the grammar, structure and idiom of the language;

(4) One paper on translation from as well as into Sanskrit, the passages given for translation not being taken from any of the prescribed text-books :

and in the special part there shall be—

(1) Three papers on the prescribed text-books ;

(2) An essay in English on a subject intimately related to the specified branch or branches of Sanskrit literature from which the text-books of the special part are prescribed.

(vii) *Arabic Language and Literature.*

Courses of Study—

vii. Arabic Language and Literature.

1. Every candidate, who presents himself for this branch of the Honours B.A. Examination, shall be required to possess a sound knowledge of the principles of comparative philology and of the elements of comparative grammar with special reference to the important Semitic languages.

2. The course of studies shall further consist of one part fitted to equip the student with a general knowledge of the Arabic language and literature, and also of another part fitted to enable him to acquire a special knowledge of any specified branch or branches of that literature as prescribed from time to time.

3. The course in the general part shall comprise—

(1) The history of the language ;

(2) The history of the literature in the language.

(3) Grammar, prosody and poetics ;

(4) Prescribed text-books in poetry and prose, the selections being fairly representative of the various stages in the life of the Arabic language and literature ;

(5) Translation from Arabic into English, and from English into Arabic.

4. The course in the special part shall comprise—

(1) Prescribed text books selected from any specified branch or branches of Arabic literature ;

(2) A critical and comparative inquiry into the contents and value of the specified branch or branches of the literature taken up for study by the candidate.

Examination—

1. There shall be a paper on the principles of comparative philology and the elements of Semitic comparative grammar.

2. In addition to this there shall be in the general part—

(1) One paper on the history of the Arabic language and literature ;

(2) One paper on grammar, prosody and poetics ;

(3) One paper on the prescribed text-books in which also there shall be questions on the grammar, structure and idiom of the language ;

(4) One paper on translation from as well as into Arabic, the passages given for translation not being taken from any of the prescribed text-books ;

and in the special part there shall be—

(1) Three papers on the prescribed text-books :

(2) An essay in English on a subject intimately related to the specified branch or branches of Arabic literature from which the text-books of the special part are prescribed.

Marks qualifying for a pass

10. A candidate shall be declared to have taken honours in one of the branches of knowledge for the B.A. (Honours) degree if he obtains not less than 40 per cent of the total marks and not less than 30 per cent in each division of the examination, provided that the passing minimum in each divison of the examination in Branch (iv) shall be as specified hereunder. All other candidates shall be deemed to have failed in the examination for Honours. The divisions shall be as follows :—

Divisions

Branch i. (*a*) Pure Mathematics, (*b*) Applied Mathematics, (*c*) Optional Subject.

Branch ii. (*a*) Logic, and Psychology or Ethics, (*b*) General Philosophy, Outlines of European Philosophy and Outlines of Indian Philosophy, (*c*) Optional Subject and Essay.

Branch iii. A. (*a*) Indian History and Constitutional History, (*b*) Politics and Economics, (*c*) Special Subjects.

B. (*a*) Economics (two papers), (*b*) Politics and Indian History, (*c*) Special Subjects.

Branch iv. (*a*) All the five papers in the first language, excluding the additional paper in Composition as in Regulation 9 of this Chapter.

(*b*) The additional paper in Composition in the first language, as in Regulation 9 of this Chapter.

(*c*) All the five papers in the second language excluding the additional paper in Composition as in Regulation 9 of this Chapter.

(*d*) The additional paper in Composition in the second language, as in Regulation 9 of this Chapter.

The passing minimum in each of the two divisions of the examination in an Indian vernacular shall be 40 per cent while in other cases it shall be 35 per cent in each of the two divisions.

Branch v. (*a*) English language, (*b*) English literature, (*c*) Special period or Subject.

Branches vi and vii. (*a*) Comparative Philology and Comparative Grammar, (*b*) General part, (*c*) Special part.

Classification of successful candidates

Candidates obtaining honours shall be ranked in the order of proficiency as determined by the total marks obtained by each and shall be arranged in three classes:—

The *first,* consisting of those who obtain not less than 60 per cent; the *second,* of those who obtain not less than 50 per cent; and the *third,* of those who obtain not less than 40 per cent.; of the total marks.

DEGREE OF MASTER OF ARTS.

Honours graduates proceeding to M.A.

11. Upon payment of a fee of Rs. 25 a graduate in Honours may, without further examination, proceed to the degree of M.A. after the lapse of five years from the date of his having passed the Intermediate Examination in Arts and Science.

M.A. Degree Examination; qualification to appear

12. A Bachelor of Arts of this University after an interval of two years from the date of qualifying for that degree may further qualify for the M.A. Degree by passing the prescribed examination in any one of the following subjects:—

I. Mathematics.

II. Philosophy.

III. History, Economics and Politics.

IV. Two languages other than English; one being a classical language already studied in the Intermediate Course; provided however that this restriction shall not apply if one of the two languages selected is Sanskrit and the other an Indian Vernacular.

V. English Language and Literature.

VI. Sanskrit Language and Literature.

VII. Arabic Language and Literature.

Such Bachelor of Arts when qualified may, upon payment of a fee of Rs. 25, proceed to the Degree of M.A., after a lapse of five years from the date of his having passed the Intermediate Examination.

For the purpose of this Regulation a Bachelor of Science who has passed in Part II—Mathematics will be deemed to have satisfied the requirement of a pass in that subject in order to be eligible to appear for the M.A. Examination, provided that an interval of two years has elapsed from the date of qualifying for the B.Sc. Degree.

Nothing in this Regulation will, however, prevent a Master of Arts of this University from being allowed to appear for the M.A. Degree Examination in any one of the subjects prescribed for that examination upon payment of the prescribed fees.

Provided, however, that it shall be competent for the Syndicate to recognise the B.A. Degree Examination of the Andhra University as equivalent to the B.A. Degree Examination of this University for purposes of enabling Bachelors of Arts of the Andhra University to appear for the M.A. Degree Examination of this University under the prescribed conditions. This Regulation shall be in force for a period of five years from the March—April Examinations of 1929, (*i.e.*, to the end of the examination of March—April 1933).

Subjects for Examinations

13. A candidate shall be examined in—

I. Mathematics

I Mathematics

Pure and Applied Mathematics in accordance with lists (*a*), (*b*) and (*c*) of subjects prescribed for candidates for the B.A. (Honours) Degree Examination in Regulation 9 (i) of this Chapter—i. Mathematics.

II. Philosophy

II. Mental and Moral Science

(1) Logic and Theory of Knowledge, according to a syllabus.

(2) Either Psychology or Ethics, as the candidate may prefer, according to a syllabus.

(3) Outlines of European Philosophy, according to a syllabus.

(4) Outlines of Indian Philosophy, according to a syllabus.

(5) A prescribed modern work dealing constructively with the general problems of Philosophy.

III. History, Economics and Politics.

III. A & B History, Economics and Politics

The subjects prescribed for candidates for the B.A. (Honours) Degree Examination in Regulation 9 (iii) of this Chapter—History, Economics and Politics, provided that candidates for the M.A. Degree Examination shall be restricted in their choice of optional subjects to those offered in each particular year by candidates for the B.A. (Honours) Degree Examination.

IV. Two Languages other than English.

IV. Two Languages other than English

The course in each language, the text-books prescribed and the examination therein shall be identical with those prescribed for Branch (iv) mentioned in Regulation 1 of this Chapter, the provision for exemption from certain portions of the examination as set forth under Branch iv in Regulation 9 of this Chapter being applicable to such candidates for the M.A. Degree in Branch iv under Regulation 12 of this Chapter as have passed the B.A. Degree Examination in Group (vi).

V. English Language and Literature.

V. English Language and Literature

(*a*) The History of the English Language, Old and Middle English.

(*b*) The History of English Literature, Shakespeare, Modern English Literature.

VI. Sanskrit Language and Literature.

or

VII. Arabic Language and Literature.

VI. Sanskrit Language and Literature
VII. Arabic Language and Literature

The courses shall be identical with those prescribed for candidates for the B.A. (Honours) Degree Examination in Regulation 9 (vi) or (vii) respectively of this Chapter, with the omission of Comparative Philology and Comparative Grammar.

14. So far as provision is made in the foregoing regulation for subjects of examination corresponding with subjects offered by candidates for the B.A. (Honours) Examination, the examination for the Degree of Master of Arts shall be, in respect of the subjects and books offered and the question papers which candidates are required to answer in each year, identical with the final examination as conducted in that year in accordance with the regulations for the Degree of Bachelor of Arts (Honours) except that the paper set in History of the English Language shall not include questions the answers to which involve a knowledge of Gothic. No candidate shall be required to undergo a *viva voce* Examination.

Examinations identical with B.A. (Honours)

15. A candidate shall be declared to have passed the examination for the degree of Master of Arts if he obtains not less than 40 per cent of the total marks and not less than 30 per cent of the marks in any division of the examination in which a separate minimum is required, provided that the passing minimum in each division of the examination in Branch iv shall be as specified hereunder. All other candidates, shall be deemed to have failed in the examination. These divisions shall be as follows.

Marks qualifying for a pass

Divisions of the examination

Branch I—(*a*) Pure Mathematics, (*b*) Applied Mathematics, (*c*) Optional Subject.

Branch II—(*a*) Logic, and Psychology or Ethics.

(*b*) Outlines of European Philosophy and Outlines of Indian Philosophy, (*c*) General Philosophy and Essay.

Branch III—A. (a) Indian History and Constitutional History, (b) Politics and Economics, (e) Special Subjects.

B. (*a*) Economics (two papers), (*b*) Politics and Indian History, (*c*) Special Subjects.

Branch IV—(*a*) All the five papers in the first language, excluding the additional paper in Composition, as in Regulation 9 of this Chapter.

(*b*) The additional paper in Composition in the first language, as in Regulation 9 of this Chapter.

(*c*) All the five papers in the second language excluding the additional paper in Composition, as in Regulation 9 of this Chapter.

(*d*) The additional paper in Composition in the second language, as in Regulation 9 of this Chapter.

The passing minimum in each of the two divisions of the Examination in an Indian vernacular shall be 40 per cent, while, in other cases, it shall be 35 per cent in each of the two divisions.

Branch V—*English Language and Literature*—No divisions.

Branch VI or VII—(*a*) General part, (*b*) Special part.

Classification of successful candidates.

Successful candidates who obtain not less than 60 per cent of the total marks shall be declared to have passed the examination in the *first* class; those who obtain not less than 50 per cent shall be declared to have passed in the *second* class; and those who obtain not less than 40 per cent shall be declared to have passed in the *third* class.

B. A. (HONS.) DEGREE EXAMINATIONS.

Text-books.

Vide Appendix IV.

ECONOMICS

BRANCH III-B.

Economics, General I

(Includes the scope and method of Economics, the theory of Value, Production, Distribution and Consumption.)

Economics, General II

(Includes Banking and Currency, International Trade, Public Finance. Business and Labour Organization, and other questions of Applied Economics).

Books recommended for I & II

For Study:

Marshall: Principles of Economics.

Marshall: Industry and Trade.

Nicholson: Principles of Economics.

Taussig: Principles of Economics.

Pigou: Economics of Welfare.

For Reference:

Gide and Rist: History of Economic Doctrines.

Haney: History of Economic Thought.

Haney: Business Organization and Combination.

Pierson: Principles of Economics.

Devas: Political Economy.

Imperial Gazetteer of India, Vols. III and IV.

Indian Year Book.

SPECIAL SUBJECTS.

The same as for (B.A. Hons.) under Revised Regulations *Vide* Appendix iv.

M. A. Degree Examination.

TEXT-BOOKS.

TWO LANGUAGES OTHER THAN ENGLISH.

BRANCH (iv).

The same as for Part III—Group (v) of the B.A. Degree Examination under the New Regulations for all the Languages.

SANSKRIT LANGUAGE AND LITERATURE.

BRANCH (vi).

The same as for Branch (vi)—B.A. (Hons.) for 1932 and 1933, respectively with the omission of Comparative Philology and Comparative Grammar.

EXAMINATION, 1932.

TAMIL.

1932

Additional Paper on Composition

Books prescribed :—

Toluvūr Vēlāyudha Mudaliyar's Tiruvēṇkaṭṭaḍigal Charittiram (Ripon Press, Madras).

Mullaippāṭṭāraychi, by Swami Vedachalam, Pallavaram.

Essay on Kambar, by T. Chelvakesavaraya Mudaliyar.

TELUGU.

1932

Kavyālankara Chūdamaṇi.

Amukta Mālyada.

Note—Candidates are expected to make a critical study of these books and the most recent opinion on them, if any.

KANARESE.

1932

(i) Kavisamaya by M. A. Ramanujiengar (Kavya Kalanidhi Office, Mysore).

(ii) Nataka Kale by Atmarama Sastri Odlamane (Bala Sahitya Mandala, Mangalore).

(iii) Karnataka Gatha Vaibhava by Venkatarao Alur, B.A., LL.B., ("Jayakarnataka" Office, Dharwar).

(iv) Sarvajnya Padyagalu edited by C. D. Uttangi (Sri Shankar Book Depot, Malmaddi, Dharwar).

MALAYALAM.

1932

Poetry—

1. Gouricharitam—Prabhandham (Secretary of the Malayalam Improvement Committee, Trichur).
2. Kalakeyavadham,, by Kottayath Thampuran (by Publisher).
3. Girija Kalyanam Kilipattu by Unnayi Varier (Government Press, Trivandrum).

Prose—

Sūrasimham—by Karthika Thirunal Thampuratti, Anantapuram Kottaram, Arippad, Travancore.

PERSIAN AND URDU.

1932

Urdu—Fasana-i-Azad, Vols: I & II.

Persian—Iran Nameh excluding old Persian.

M. A. DEGREE EXAMINATION, 1933.

ORIYA.

1. **"Arya Jeevana" by Nilakantha Das.**
2. **"Prabandhasara" by Jagabandhu Singh.**
3. **Bayi Mahanty Panjee by Gopalachandra Praharaj.**

TAMIL.

The same as for 1932.

TELUGU.

The same as for 1932.

KANARESE.

The same as for 1932.

MALAYALAM.

The same as for 1932.

ARABIC, PERSIAN AND URDU.

Arabic—

Muqaddima-i-Ibnikhardun—1st half.

Persian.—

Iran Nameh—Excluding Old Persian Portion.

Urdu.—

Fasana-i-Azad—Vols. I and II.

APPENDIX XVII

COURSES OF STUDY AND EXAMINATIONS FOR THE B.A. (HONOURS) DEGREE EXAMINATION IN PHYSICAL AND NATURAL SCIENCES.

(UNDER EXISTING REGULATIONS).*

(Extract from the Regulations of 1918 Calendar).

A. Course of Study.

1. For the B.A. (Honours) degree the course shall extend over a period of not less than three years and shall comprise instruction in:—

I. English.

II. Optional Branch.—

(i) Any two of the following subjects, one of which shall be the main subject and the other the subsidiary subject.

i. Physics.

ii. Chemistry.

iii. Botany.

iv. Zoology.

v. Geology.

vi. Physiology.

(ii) Mathematics as a subsidiary subject with Physics as the main subject.

(iii) The subsidiary course in Mathematics shall be the same as for the subsidiary course in Mathematics for the B.A. Pass Course.

Note.—The regulations in the main calendar in regard to Fees, dates for application for registration, Examination, etc., will apply.

*These Regulations will remain in force till the year in which the examination for the B.Sc. (Honours) Degree will be held for the first time.

B. Examinations.

* * * *

2. (a) No candidate shall be eligible for the B.A. (Honours) degree until he has passed an examination in one of the branches of knowledge contained in the courses of study.

(b) No candidate, other than those hereafter exempted, shall be admitted to the final examination in Honours unless he has passed a preliminary examination.

This preliminary examination shall be in English for the B.A. degree in (1) Composition, (2) Nineteenth Century Prose.

* * * *

(c) No candidate shall be declared to have passed the preliminary examination unless he obtains forty per cent. of the total marks in the two papers. Candidates obtaining not less than sixty per cent. of the total marks shall be declared to have passed with distinction.

3. No candidate shall be admitted to the preliminary examination unless he has passed the Intermediate Examination in Arts in this University or an examination in some other University recognised by the Syndicate as equivalent thereto. Each candidate must forward with his application his Intermediate or other accepted certificate.

* * * *

4. A candidate for the B.A. (Honours) degree shall appear for the final examination in Honours not later than the end of the fourth year after he has passed the Intermediate Examination.

5. No candidate shall be permitted to undergo the complete final examination in Honours more than once.

6. In the event of a candidate for the B.A. (Honours) degree failing to satisfy the Examiners he may be recommended by them for the B.A. degree, provided that he obtains not less than 33⅓ per cent of the total marks and not less than twenty-five per cent in each division of the examination.

7. A candidate not already eligible for the B.A. Degree, who, having failed completely in the B.A. (Honours) Degree Examination, desires to appear for the B.A. Degree Examination shall be allowed to do so without the production of a further certificate of attendance in an affiliated college.

* * * *

8. No candidate shall be admitted to the examination until he has been registered.

* * * *

9. A candidate for the B.A. (Hons.) degree who has passed the B.A. or the B.Sc. Degree Examination shall be permitted to appear for the B.A. (Hons.) Degree Examination after a two years course, provided he has passed the B.A. or the B.Sc. Degree Examination in the main subject in which he desires to appear Each such candidate shall forward so as to reach the Registrar before the 20th March preceding the Examination, certificates, in the form hereinafter prescribed, from the head of an affiliated college to the effect that he has attended an affiliated college for a period of at least two years after passing the B.A. or the B.Sc. Degree Examination, that he has completed the course of instruction in the subjects in which he proposes to appear and that his conduct and progress have been satisfactory. He shall be exempted from passing the preliminary examination, and if he appears for the examination in the Science Branch, he shall be exempted from examination in the subsidiary subject, and shall be credited with the percentage of marks which he obtained in that subject in the B.A. or the B.Sc. Degree Examination.

10. A candidate who has already qualified for the Degree of Bachelor of Arts (Honours) in any of the subject may further qualify for that degree in an additional allied Science Branch as the main subject.

A candidate desirous of coming under the provisions of the above regulation shall submit his laboratory note-book containing the record of his practical work performed during the period of study for the Examination (duly certified by his Professor) as a *bona fide record* of work done by him. The laboratory note-book shall be submitted on the first day of the Practical Examination to the Examiners engaged in conducting the Examination.

He shall be exempted from examination in the subsidiary subject, provided it was the main subject in which he previously qualified for the Honours Degree.

A candidate coming under the provisions of this Regulation shall be declared to have passed the Examination if he has obtained not less than 40 per cent. of the total marks, and 30 per cent. of the marks in each division of the Examination. The Divisions shall be as follows:—

(*a*) Written examination in the Main subject.

(*b*) Practical examination and laboratory note-books in the Main subject.

(1) i. PHYSICS.

Physics.—A candidate shall be required to have a sound knowledge of the experimental side of the following subjects, and also such knowledge of the theoretical side of each as may be obtained by the applications of the calculus, and simple differential equations:—

Properties of Matter.

Heat.

Geometrical and Physical Optics.

Sound.

Magnetism and Electricity.

A candidate shall also be required to have a special knowledge, experimental and theoretical, of one of the following subjects, the choice of subject being left to the option of the candidate:—

Thermodynamics.

Theory of Heat Conduction.

Kinetic Theory of Gasses and its applications.

Theory of Electricity and Magnetism.

Radio-activity.

Theory of Sound and Wave Theory of Light.

Radiation A—Electrical waves, wireless telegraphy and telephony.

Radiation B—X Rays and their applications.

A candidate shall give notice through his college, a year before the date of the examination, of the particular subject he proposes to take.

The knowledge of the candidate shall be tested by a practical examination, in which he will be expected to make physical measurements and observations of the advanced kind.

Each candidate shall submit his laboratory note-books containing the record of all his practical work performed during the period of study for the examination. The record shall be countersigned by the professor or professors under whom the candidate has worked to certify it to be a *bona fide* record of work performed by the candidate. It shall be submitted on the first day of the practical examination to the examiners engaged in conducting the examination.

Chemistry.—The course shall be the same as that prescribed for students taking the course (ii-A) for the B.A. degree.

(1) ii. CHEMISTRY.

Chemistry.—A candidate shall be required to show that he has made a more comprehensive study than for the B.A. degree, of the four main divisions of the subject:—

1. General theoretical Chemistry, including its historical development.
2. Chemistry of the non-metals and metals.
3. Chemistry of the carbon compounds.
4. Physical Chemistry.

A candidate shall also be required to have a special knowledge, experimental and theoretical, of *one* of the following subjects, the choice of subject being left to the option of the candidate:—

(*a*) Electro-Chemistry.

(*b*) Mineralogy and Elementary Crystallography.

(*c*) Elementary Crystallography and Stereo-chemistry.

(*d*) Metallurgical Chemistry.

(*e*) Tinctorial Chemistry.

(*f*) Bio-Chemistry.

(*g*) Chemistry of the rare earths and radio-elements.

A candidate shall give notice through his college, a year before the date of the examination, of the particular subject he proposes to take.

The candidate shall be required to be practically familiar with the ordinary methods of experiment, and of the methods of analysis in common use, including the manipulation of gases. The examination shall also include the estimation of carbon, hydrogen, nitrogen, sulphur and the halogens in organic compounds; and the determination of molecular weights by the freezing and boiling point methods, and by vapour density.

The candidate shall submit his laboratory note-books containing the record of all his practical work performed during the period of study for the examination. The record shall be countersigned by the professor or professors under whom the candidate has worked to certify it to be a *bona-fide* record of work performed by the candidate. It shall be submitted on the first day of the practical examination to the examiners engaged in conducting the examination.

Physics.—The course shall be the same as for students taking the course in (ii-B) for the B.A. degree.

(1) iii. BOTANY.

The syllabus of examination for Botany, Zoology, Geology, and Physiology—Subsidiary shall be the same as that for the subsidiary subject in the B.A. degree, but the standard shall be higher.

In the main subject every candidate shall submit his laboratory note-books containing the drawings or other record relating to all his practical work performed during the period of study for the examination. The record shall be countersigned by the professor or professors under whom the candidate has worked and shall be certified to be a *bona-fide* record of work performed by the candidate. It shall be submitted on the first day of the practical examination to the examiners engaged in conducting the examination.

The examination shall consist of—

1. In the main subject—

Four papers of three hours each.

Three-practical examinations of three hours each.

Laboratory note-books.

2. In the subsidiary subject—

Two papers of three hours each.

A practical examination of three hours.

A. Main.

1. The general Morphology and Physiology of plant, and the peculiarities of form or structure depending on habit or habitats.

2. The systematic position and relationships of the chief flowering plants and ferns of India and in general of flowerless plants more especially those of economic importance.

3. General Palæobotany especially with reference to the relationships of modern plants.

4. Methods of pollination and seed dispersal, and their connection with members of the animal kingdom. Phenomena of heredity, and of selection, natural and artificial.

The practical examination may include—

1. The identification of Indian plants with the help of a FLORA or of any other books that may be available.

2. The preparation and correct interpretation of microscope sections of plants.

3. The examination of any diseased or abnormal plant.

4. Practical Physiology and *viva voce* examination.

B. Subsidiary.

(1) The structure and life history of the following:—

Bacteria, Oscillaria, Nostoc, Chlamdamonas, Panidarina, Eudorina, Pleodorina, Volvox, Ulothrix, Culadophora, Oedogonium, Spirogyra, Desmids, Diatoms, Ectocarpus, Fucs or Sargassum, Polysiphonia, Gracillaria, Nitella or Chara, Phytophthora, Rhizopus, Penicillium, Peziza, Puccinia, Agaricus, Riccia, Marchantia, Mosses, Selaginella, Fern, Marsillia, Cycas, Pine.

(2) External Morphology of Flowers.

(3) The general principles of classification and the distinguishing characteristics of the following families:—

Anonaceæ, Nymphæaceæ, Leguminosæ, Capparideæ, Malvaceæ, Sterculiaceæ, Tili, aceæ, Geramaceæ, Rutaceæ, Meliaceæ, Rhamnaceæ, Combretaceæ, Myrtaceæ, Lythraceæ, Cucurbitaceæ, Umbelliferæ, Rubiaceæ Compositæ, Apocynaceæ, Asclepiadaceæ, Convolvulaceæ, Solanaceæ, Acanthaceæ, Labiatæ, Amaran-taceæ, Euphorbiaceæ, Urticaceæ, Liliaceæ, Amaryllideæ, Scitamineæ, Orchideæ, Palmæ-Cyperaceæ, Gramineæ,

(4) Plant Physiology:—

Chemical composition of the plant, soil and its nature. Photosynthesis, Transpiration, Respiration, Metabolism, Heterotrophic Plants, Growths, Movements, Irritability, Reproduction (Sexual and Asexual) Cross and Self Fertilization, Variation, Heredity and Mendalism. Theories of Evolution and the Origin of Species.

Cell structure and Cell division, plastids, Cell-sap, other Cell contents, the origin, nature and development of Plant-tissues Primary and secondary tissues and their distribution in the plant body.

iv. ZOOLOGY.

The course shall be more complete than that for the B.A. degree. Candidates will, in addition to the scheme already outlined, be excepted to have a knowledge of minor groups like the Mosozoa, the more important groups of extinct animals, the early development of the chick and the outlines of Vertebrate embryology and to go into the classification more fully. The practical work will not be confined to the types enumerated. The candidates may be required to dissect any of the more common types of animals included in the classes they study, to identify specimens with the aid of manuals, to report upon zoological collections, to make microscopical preparations, to cut sections with the microtome, and to show their practical acquaintance with the methods employed in studying the embryology of the chick.

v. GEOLOGY.

Minerology.—The syllabus of the B.A. degree course treated more fully and the following:—the thirty-two types of crystal symmetry, systems of crystal notation, zonal characters, crystal projection and drawing. Twin crystals, grouping and irregularities of crystals, parting-planes, percussion-figures, etching figures, etc. Use of the goniometer: general behaviour of mineral sections in polarized light; determination of minerals by chemical, physical and optical tests. The common metallic ores and their occurrence with special reference to India.

Petrology.—The syllabus of the B.A. degree course treated more fully and the following:—the chief Indian rocks and their distribution and economic value if any; mechanical analysis of rocks. Description and determination of rocks and rock-structures.

Physical Geology.—The B.A. degree course treated more fully and also the following:—rock-weathering and formation of soils, the composition and structure of rock masses as influencing scenery; circulation of underground water and its effects.

Stratigraphy and Paloeontology.—General distribution of existing faunas and floras and their relation to those of former geological periods; morphological characters of the more important general and the larger groups of fossils; conditions of their

distribution in present and past time; characteristic fossils of the successive geological systems; principles of correlation. Homotaxis.

Indian Geology.—Geology of India brought up to date.

Practical Examination.—Drawing and interpretation of geological maps and sections; identification and description of minerals, rocks, fossils, and models. Use of the petrological microscope, goniometer, heavy liquids, etc. Problems on structural and field geology. Principles and methods of geological surveying.

Candidate will be expected to have had practice in field work.

vi. PHYSIOLOGY.

Definition and Scope of Physiology. Problem of Physiology. Living and dead matter. The cell. Protoplasm and its properties. Histology of the principal tissues and organs of the body. Chemical composition of the body. Muscle. Irritability. Contractility. Muscle-nerve preparation. Muscular contraction. Changes during contraction. Nature of muscular and nervous action. Electrotonus. Circulatory system and circulation. Regulation of the vascular mechanism. Vasomotor action. Inflammation. Composition of blood. Coagulation of the blood. Lymphatic system. Nature and movements of lymph. Secreting glands. Foodstuffs. Nature, properties and secretion of saliva, gastric juice, bile, pancreatic juice, and succus entericus. Mechanism of digestion. Changes which food undergoes in the alimentary canal. Absorption. Liver and its work. The ductless glands and what is known about their functions. Respiration. Respiratory mechanism. Nervous mechanism of respiration. Changes of the air during respiration. Changes in the blood. Respiration of the tissues. Asphyxia. Effect of respiration on the circulation. Special respiratory movements. Cutaneous respiration. Composition, character and secretion of urine. Urinary apparatus. Micturition. Nature and composition of sweat. Mechanism of the secretion of sweat. General metabolism. Statistics of nutrition. Diet. Energy of the body. Temperature of the body. Production and regulation of animal heat. Nerves and nerve-functions. Trophic nerves. Columns and tracts of the spinal cord; evidence for their existence. Functions of the cord. Reflex action. Structure of the brain. Disposition and connections of the grey and white matter of the brain. Functions of the brain. Removal of the cerebrum. Localization of cerebral functions. Cerebellum. Machinery of co-ordinated movements. Sensations. Structure of the eye. The eye as an optical instrument. Accommodation. Imperfections in the visual apparatus. Features of visual sensation. Colour sensation. Binocular vision. Visual judgments. Structure of the ear. Auditory sensation. Taste and smell. Cutaneous sensations. Muscular sense. Mechanism of locomotion, voice and speech. Imprêgnation. Outlines of the development of the embryo and its envelopes. Nutrition of the embryo. Birth. Lactation. Phases of life. Death.

Practical Examination.—Candidates must be prepared to answer *viva voce* questions, to examine, stain, mount and describe sections, and to identify microscopic preparations. They must show their practical acqaintance with the chemistry of albumin and its allies, milk, glycogen, the digestive juices and their action on food, blood and urine. They will be expected to be familiar with the use of the most important apparatus employed in studying the physiology of muscle, nerve, the circulatory and respiratory systems and the organs of sense.

Taken as a subsidiary subject, Physiology shall include a knowledge of the essential facts of the structure and functions of the body as indicated below.

Food, digestion and absorption. Nature, composition and functions of the blood. Circulation. Vasomotor action. Lymph. Respiration and the respiratory mechanism. Secretion. Work of the liver. Sweat and its formation. Work of the kidneys. Temperature of the body and its maintenance. Various modes in which muscles give rise to movement. Functions of the principal parts of the central nervous system. Functions of nerves. Reflex action. General account of the sensory organs.

In the practical examination candidates will be expected to answer *viva voce* questions, and to identify microscopical preparation. They must show their practical acquaintance with the chemistry of albumin, milk, and urine, and with the action of the digestive ferments on food. They may be required to take tracings of a simple muscular contraction, and of a contracting heart.

A candidate shall be declared to have taken honours in one of the branches of knowledge for the B.A. (Honours) Degree if he obtains not less than forty per cent of the total marks and not less than thirty per cent. in each division of the examination. The divisions shall be as follows:—

* * * *

(*a*) Written Examination in the Main Subject, (*b*) Practical Examination and laboratory note-books in the Main Subject, (*c*) Subsidiary Subject.

* * * *

Candidates obtaining honours shall be ranked in the order of proficiency as determined by the total marks obtained by each and shall be arranged in three classes:—

The *first* consisting of those who obtain not less than sixty per cent; the *second*, of those who obtain not less than fifty per cent; and the *third*, of those who obtain not less than forty per cent of the total marks.

B.Sc. (HONS.) DEGREE EXAMINATION.

"PLANETARY AND LUNAR THEORIES".

A. Dynamical Principles.—Lagrange's equations and the Lagrangian function. Hamilton's principle and the derivation of

the equations of dynamics by the variation of Hamilton's principal function. The ordinary Hamiltonian equations and the canonical equations of dynamics. The necessary and sufficient **condition that a change of variables should leave the canonical form of the equations (in the new variables) unchanged. Hamilton's theorem that the principal function satisfies a partial differential equation when the constants of integration of the canonical equations are the initial values of the co-ordinates. The Hamilton-Jacobi partial differential equation and its relationship to the solution of the canonical equations.**

B. Newton's Law of Universal gravitation and the problem of two particles.—Kepler's Laws. Newton's deduction of the Law of Gravitation from Kepler's Laws. Possible forms of force in order that a particle may describe a conic section under the action of a central force. Bertrand's first theorem that the only laws of central force which are functions of the distance, under the action of which a particle will describe a conic are $f = \pm \frac{K^2}{r^2}$ and $f = \pm K^2 r$. Bertrand's second theorem that the only laws expressible as functions of the distance, which always give rise to closed orbits, whatever the initial circumstances may be (within a certain range) are $f = \pm \frac{K^2}{r^2}$ and $f = \pm K^2 r$. Evidence of double star systems : Newton's Law of Gravitation universal.

Elliptic motion. The fundamental equations of elliptic motion. Bessel's functions and the relations between the functions of different order. The expansions of the radius vector, the eccentric anomaly; the true anomaly, etc., in terms of the eccentricity of the orbit. Convergence of these series.

C. The problem of n bodies. Planetary Theory.—The potential of an attracting system and its relation to the force of attraction. The potential and attraction of a spherical shell at internal and external points. The potential and attraction of any heterogenous spherical body which is made up of concentric spherical shells of the same density. The potential of a body at a distant point. The motion of n heavenly bodies under the law of gravitation is practically the same as the motion of n massive attracting particles. The integrals of the equations of motion of n particles. Jacobi's equation establishing a necessary condition for the stability of the system. Radau's transformation of the form of the kinetic energy and the angular momentum and the resultant form of the equations of motion. Heliocentric co-ordinates and the equations of motion in terms of them. The disturbing function. Advantages and disadvantages of either of the above two forms of the equations of motion. Solution of the equations $\ddot{x} - \frac{(S+m)x}{r^3} = \frac{\delta R}{\delta x}$ by the method of the variation of parameters. Intermediate orbits, Lagrange's brackets and Poisson's brackets and their relationship to each other. The equations of motion expressed in

terms of them and the six arbitrary constants of the solution of the equations when R=O. The Lagrange brackets do not contain the time explicitly. The equations of motion expressed in terms of the Lagrange brackets reduced to the canonical form when the six arbitrary constants are the initial co-ordinates and velocities of the moving body. The expression of a Lagrange bracket in terms of the elements of the orbit.

The canonical elements and the canonical form of the equations of motion when these are used. Jacobi's method of solving the equations of elliptic motion by means of the partial differential equation. Jacobi's equations for disturbed elliptic motion. The canonical constants of Jacobi, Delaunay and Poincare. The expressions for the Lagrange brackets and the Poisson brackets containing the elements. The equations for the variation of the elements and the disturbing forces expressed in terms of the partial differential co-efficients of the disturbing function with respect to the element. Elementary proof for the equation for $\frac{da}{dt}$ The difference between secular inequalities and periodic inequalities. Example of a resisting medium. Long period inequalities and short period inequalities. The inequalities of the Jupiter—Saturn system. The major axes and the mean motions of planets have no secular inequalities in the first approximation. The application of Radau's transformation and the resultant formulae to the proof of Poisson's Theorem that the major axes of planets have no purely secular inequalities even in the second approximation. (The proof of Poisson's theorem is excluded.)

D. *The Lunar Theory.*—The equations of the Sun relative to the centre of gravity of the Earth and the Moon. The motion of the Sun is practically elliptic. The equations of motion of the Moon relative to the earth. Form of the disturbing function. Jacobi's quasi-integral for the Moon's motion (*i.e.*, under the assumption that the Sun moves in a circle). Pontecoulant's equations of motion and their solution up to the second approximation. Variational inequalities. Elliptic Inequalities. The Evection. The motion of Perigee. Mean period inequalities The Annual equation. Parallactic inequalities. The latitude equation and the motion of the node. Hill's form of the equations of motion of the Moon. Reduction to one equation giving both the radius vector and the longitude to any desired degree of approximation. The variational curve. Differential equations for small displacements from the variational curve. Hill's equation for the normal displacement, viz., $\frac{d^2N}{dt^2} = \Theta N$. applies to all inequalities independent of the eccentricity of the Sun's orbit. The infinite detriminant. Motion of the perigee and the node. Outline of the method of finding the displacement of the Moon from the variational curve when the eccentricity of the Sun's orbit and the parallax are not neglected.

(*a*) **Books recommended for Study—**

(1) E. W. Brown's Lunar Theory omitting Chapters IX, X and XIII and greatly restricting Chapter XI.

(2) H. C. Plummer's Dynamical Astronomy. Chapters I, II, IV, XII, XIII, XV and Chapter XX and XXI greatly restricting the last two.

(3) Hill's Lunar Theory as given in Vol. V of Darwin's Scientific Papers.

(*b*) **Books for Reference—**

(1) F. R. Moulton's Introduction to Celestial Mechanics.

(2) Cheyne's Planetary Theory (out of print).

(3) J. C. Adam's Lectures on the Lunar Theory (out of print).

(4) Dziobek's Mathematical theories of Planetary motions.

(5) Poincare's Lecons de Mecanique Celeste Tomes I and II.

(6) Tisserand's Traite de Mecanique Celeste Tomes I and II.

PHYSICAL SCIENCE

Branch (ii A) Physics.

Books for Study—

Physics.—

Cox: Mechanics (Cambridge University Press).

Lamb: Dynamics (Cambridge University Press).

Barton: Analytical Mechanics (Longmans).

Wagstaff: Properties of Matter (Clive).

Poynting and Thomson: Properties of Matter (Griffin).

Edser: General Physics (Macmillan).

Searle: Experimental Elasticity (Cambridge University Press).

Poynting and Thomson: Sound (Griffin).

Capstick: Sound (Cambridge University Press).

Barton: Text-book of Sound (Macmillan).

Preston: Theory of Heat (Macmillan),

Poynting and Thomson: Heat (Griffin).

Wood: Physical Optics (Macmillan).

Houstoun: Treatise on Light (Longmans).

Clay: Treatise on Practical Light (Macmillan).

Mann: Manual of Advanced Optics (Chicago University Press).

Whetham: Experimental Electricity (Cambridge University Press).

Thomson: Elements of Electricity and Magnetism (Cambridge University Press).

Pidduck: Treatise on Electricity (Cambridge University Press).

Lamb: Alternate Currents (Cambridge University Press).

Starling: Electricity and Magnetism (Longmans).

Millikan: The Electron (Chicago University Press).

Schuster and Lees: Practical Physics (Cambridge University Press).

Glazebrook and Shaw: Practical Physics (Longmans).

Watson: Practical Physics (Longmans).

Reference—

Ewing: The Strength of Materials (Cambridge University Press).

Lamb: Dynamical Theory of Sound (Arnold).

Schuster: Theory of Optics (Arnold).

Baly: Spectroscopy (Longmans).

Jeans: Electricity and Magnetism (Cambridge University Press).

Lorentz: The Theory of Electrons (Trubner).

Gray: Absolute Measurements in Electricity and Magnetism (Macmillan).

Whetham: Theory of Solution (Cambridge University Press).

Cunningham: Relativity, Electron Theory and Gravitation (Longmans).

Drude: Theory of Optics (Longmans).

Wilson: Modern Physics.

Roberts: Heat and Thermodynamics.

Newman & Searle: Properties of Matter.

Richardson: Sound.

Special Subjects.

KINETIC THEORY OF GASES.

Text-book.—

Bloch: Kinetic Theory of Gases.

Reference.—

Jeans: Dynamical Theory of Gases.

Loeb: Kinetic Theory of Gases.

RADIATION.

"RADIATION A."

***Electrical waves, wireless telegraphy and telephony*—**

Elementary treatment of Clerk Maxwell's Electromagnetic Theory.

Electrical oscillations and coupled circuits.

Electrical waves, propagation in dielectrics and conductors; reflection; stationary waves.

Tuning and the early experiments of Hertz, Lodges. Marconi and others.

Modern damped wave wireless telegraphy.

The singing arc and its characteristics; the Poulsen arc.

The modern Poulsen arc system of continuous wave telegraphy.

Detectors.

The Fleming valve; the triode valve and its functions as detector, amplifier and oscillator.

The modern valve system of wireless telephony

"RADIATION B."

***X-Rays and their applications*—**

Production and measurement of low pressures.

Discharge phenomena in gases at low pressures.

Production and properties of cathode rays, positive rays and anode rays.

Discussion of the main theories regarding the nature of X-rays, with special reference to low voltage X-rays levels.

Production, properties and measurements of X-rays, including technological details, functions of apparatus used, such as coils, tubes, interruptors, transformers, rectifiers, valves, screens, etc.

Characteristic, scattered and secondary X radiations, absorption phenomena, including transformations of absorbed energy.

Diffraction of X-rays, X-ray analysis of crystals, X-ray spectrometry.

Practical applications.

TEXT-BOOKS

Radiation A. Wireless—

1. Greenwood: Text-book of Wireless Telegraphy and Telephony, (Uni. Tut. Press).
2. Bangay: Oscillation Valve.
3. Brown: Elements of Radio Communication.

Reference.—

1. Stanley: Text-book on Wireless Telegraphy.
2. Palmer: Principles and Practice of Wireless.
3. Turner: Theory of Wireless.

Radiation B. X-ray—

1. X-rays—G. W. C. Kaye.
2. Modern applications of X-rays—G. W. C. Kaye.

Reference—

X-rays and crystal structure by W. H. Bragg.

Chemistry—

The same as for the Pass (Subsidiary) course.

Branch (ii-B) Chemistry.

The following books are recommended in addition to the books recommended for the Pass Group (ii-B), Course:—

Arrhenius: Theories of Chemistry (Longmans).

Ostwald: Scientific foundations of Analytical Chemistry (Macmillan).

Ladenburg: History of Chemistry (Simpkin).

Thorpe: Essays in Historical Chemistry (Macmillan).

Holleman: Organic Chemistry (Wiley).

Cohen: Organic Chemistry for Advanced Students (Arnold).

Lewis: System of Physical Chemistry (Longmans).

Le Blanc: Electro-Chemistry (Macmillan).

Findlay: Phase Rule (Longmans).

Mellor: Chemical Statics and Dynamics (Longmans).

Young: Stoichiometry (Longmans).

Fajans: Radioactivity (Methuen).

Bailey: Descriptive Mineralogy (Appleton).

Williams: Elements of Crystallography (Macmillan).

Groth: Chemical Crystallography (Gurney).

Treadwell and Hall: Qualitative and Quantitative Analysis (Wiley).

Dennis: Gas Analysis (Macmillan).

Sudborough and James: Practical Organic Chemistry (Blackie).

Clarke: Handbook of Organic Analysis (Arnold).

Spencer: Experimental Course of Physical Chemistry (Bell).

Reference—

Nernst: Theoretical Chemistry (Macmillan).

Alembic Club: Reprints (Simpkin).

Chemical Society: Memorial Lectures, 2 Volumes (Gurney).

Mellor: Treatise on Inorganic and Theoretical Chemistry (Longmans).

Spencer: Metals of the Rare Earths (Longmans).

Roberts Austen: Introduction to Metallurgy (Griffin).

Schmidt: Organic Chemistry (Gurney).

Sidgwick: Organic Chemistry of Nitrogen (Oxford University Press).

Stewart: Stereo-Chemistry (Longmans).

Armstrong: Simple Carbohydrates and the Glucosides (Longmans).

Bayliss: Enzyme Action (Longmans).

Cain and Thorpe: Synthetic Dye Stuffs (Griffin).

Perkin: Natural Organic Colouring Matters (Longmans).

Fierz-David: Fundamental Processes of Dye Chemistry (Churchill).

Soddy: Interpretation of Radium and the Structure of the Atom (Murray).

Bragg: X-rays and Crystal Structure (Bell).

Stewart: Recent Advances in Physical and Inorganic Chemistry (Longmans).

Partington: Chemical Thermodynamics (Constable).

Prideaux: Problems in Physical Chemistry (Constable).

Smiles: Chemical Constitution and Physical Properties (Longmans).

Miers: Mineralogy (Macmillan).

Biltz: Laboratory Methods of Inorganic Chemistry (Wiley).

Low: Technical Methods of Ore Analysis (Wiley).

Ephraim: Inorganic Chemistry (Gurney).

Taylor: Treatise on Physieal Chemistry (Macmillan).

Beringer: Text-book of Assaying (Griffin).

Lunge: Technical Chemists' Handbook (Gurney).

Gattermann: Practical Methods of Organic Chemistry (Macmillan).

Perkin: Practical Methods of Electro-Chemistry (Longmans).

Cole: Practical Physiological Chemistry (Heffer).

Physics—

The same as for B.A. or B.Sc. (New)—Subsidiary—Physics.

NATURAL SCIENCE.

Branch III.

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ZOOLOGY (MAIN)

Theory—

1. Parker and Haswell: Text-book of Zoology—2 Vols. (Macmillan).
2. Sedgwick (A): Student's Text-book of Zoology—3 Vols. (Swan Sonnenschein).
3. Lang (A): Text-book of Comparative Anatomy—2 Vols. (Macmillan).
4. Weidersheim: Elements of the Comparative Anatomy of Vertebrates (Macmillan).
5. Graham Kerr: Zoology for Medical Students. (Macmillan).
6. Mac Bride (E. W.): Text-book of Embryology—Vol. I—Invertebrata (Macmillan).
7. Graham Kerr: Text-book of Embryology—Vol. II—Vertebrata (Macmillan).
8. Doncaster: Introduction to the Study of Cytology: (Cambridge University Press).
9. Lull: Organic Evolution. (Macmillan).
10. Punnett: Mendelism. (Macmillan).
11. Thomson (J. A.): Heredity. (John Murray).
12. Kellogg: Darwinism to-day. (George Bell & Sons).
13. Lock: Variation, Heredity and Evolution. (John Murray).
14. Ray Lankester: Extinct Animals. (Constable).
15. Beddard (F): Zoogeography. (Cambridge University Press).
16. Jenkinson: Vertebrate Embryology. (Oxford University Press).
17. Walter: Genetics (McMillan).
18. Agar: Cytology.

Practical—

In addition to the books prescribed for B.A. Main, the following books are recommended:—

1. Chadwick: The Marine Plankton. (University Press of Liverpool).
2. Ward and Whipple: The Freshwater Biology. (Chapman and Hall).
3. Fowler Herbert: Science of the Sea. (John Murray).
4. Lee: Microtomists' Vade Mecum. (J. and A. Churchill).
5. Guyer: Animal Micrology (Uni: Press, Chicago).

Reference—

1. Ray Lankester (F); A treatise on Zoology—9 parts. (A and C. Black & Sons).
2. Cambridge Natural History—10 Volumes, (Macmillan).
3. Volumes of the Fauna of British India.
4. Wilson: Cell in development and heredity. (Macmillan).
5. Minchin: Introduction to Protozoa. (Arnold).
6. Calkin: Biology of the Protozoa. (Barliere Tindall).
7. Castle: Genetics and Eugenics. (Harvard University Press, Cambridge).
8. Bateson: Problems of Genetics. (Yale University Press).
9. Ruggles Gates: Mutation factor in Evolution. (Macmillan).
10. Charles Darwin: Origin of species (John Murray).
11. Doncaster: Determination of Sex. (Cambridge University Press).

Journals—

1. Nature.
2. Quarterly Journal of Microscopical Science.
3. Proceedings of the Zoological Society.
4. Proceedings of the Royal Society, London.
5. Philosophical Transactions of the Royal Society, London.
6. Journal of Experimental Zoology.
7. Records of the Indian Museum.
8. Memoirs of the Indian Museum.
9. Nerdiches Plankton.
10. Journal of the Royal Microscopical Society.

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Under 'Theory' *add* Chordate Development, Kellicot; and General Embryology, Kellicot.

Under 'Practical' *add* Histological Technique, Carleton (Oxford Medical Publications.)

Under 'Reference" *add* Mechanism of Mendelian Heredity, Morgan; Physical Basis of Heredity, Morgan : and the Mechanism and Physiology of Sex determination, Goldschmidt (Translated by Dakin)

B.A. (HONS.), AND B.Sc. (HONS.) DEGREE EXAMINATIONS, 1934.

To the books recommended already, add under 'Reference' the following:—

1. Wenyon: Protozoology—2 Vols.

2. De Beer: Vertebrate Morphology and under 'Journals' add Quarterly Biological Abstracts.

SUBSIDIARY.

Theory—

1. Shipley and MacBride: Text-book of Zoology. (Cambridge University Press).
2. Parker and Haswell: Text-book of Zoology 2 Vols. (Macmillan).
3. Hegner: College Zoology (Macmillan).

Practical—

1. Marshall: The Frog. (Macmillan).
2. Marshall and Hurst: Practical Zoology. (Smith Elder & Co.).

Reference—

1. Sedgwick (A): Student's Text-book of Zoology, 3 Vols. (Swan Sonnenschein).
2. Borradaile: Animal Life and its Environment. (Henry Frowde and Hodder and Stoughton).
3. Lull: Organic Evolution. (Macmillan).
4. Charles Darwin: Origin of Species (John Murray).

Geology.

(a) **For reading and study.**

A. Geikie	...	Text-book of Geology—2 Vols.
J. D. Dana	...	Text-book of Mineralogy.
Miers (H. A.)	...	Mineralogy.
James Geike	...	Structural and Field Geology.
R. M. Chalmers	...	Geological maps.
A. Dwerryhouse	...	Geological maps.
Woods	...	Paloeontology.
Swinnerton	...	Outlines of Palœontology.
Thomas and Macalister.		Ore Deposits.
Wadia	...	Indian Geology.
R. D. Oldham	...	Indian Geology.

(b) **For reference and consultation.**

Chamberlin & Salisbury.		Geology—3 Vols.
Arthur Holmes	...	Petrographic Methods and Calculations.
A. Harker	...	Natural History of Igneous Rocks.
Daly	...	Igneous Rocks and Their Origin.
A. Johannsen	...	Petrographic Methods.
Zittel	...	Paloeontology.
Graham	...	Principles of Stratigraphy.
Lindryen	...	Mineral Deposits.
Ladoo	...	Non-metallic Minerals and Deposits.
Hobbs	...	Earth's Revolution and Facial Expression.
Brush and Penfield	...	Determination Mineralogy.
Rosenbusch & Iddings	...	Physiography of Rock-forming Minerals.

Memoirs of the Geological Survey of India.

FORMS OF CERTIFICATES.

B. A. (HONOURS) DEGREE EXAMINATION.

I certify that............has attended the course of instruction in...........at the.............College for three-fourths of the number of working days in the year...........and that his progress and conduct have been satisfactory.

Dated............19 , *(Signature)*

Principal.

I certify that..........has attended a course of instruction in............at the................College for three-fourths of the number of working days in the year...............and that his progress and conduct have been satisfactory... ... .

Dated............19 . *(Signature)*

Principal.

I certify that..........has attended the course of instruction in............at the................College for three-fourths of the number of working days in the year............and that his progress and conduct have been satisfactory, and that he has completed the course of study prescribed for the B.A. (Honours) Degree Examination.

Dated............19 . *(Signature)*

Principal.

I certify that..................has attended the course of practical instruction in..........for the B.A. (Honours) Degree Examination at the............during the year............

Dated............19 . *(Signature)*

Professor or Lecturer.

I certify that..................has attended the course of practical instruction in..........for the B.A. (Honours) Degree Examination at the............during the year............

Dated............19 . *(Signature)*

Professor or Lecturer.

I certify that...................has attended the course of practical instruction in..........for the B.A. (Honours) Degree Examination at the............during the year............and that he has satisfactorily completed the course. ... ...

Dated............19 . *(Signature)*

Professor or Lecturer.

*TIME-TABLES.

BRANCH PHYSICS.

Days	Hours	Subjects	Marks
First day ...	10—1	Properties of Matter ...	100
Second day...	10—1	Heat and Sound ...	100
Third day ...	10—1	Sound and Light ...	100
Fourth day ...	10—1	Magnetism and Electricity ...	100
Fifth day ...	10—1	Optional Subject ...	200
Sixth day ...	10—1	Chemistry—or Math. I ...	100
Seventh day..	10—4	Practical Examination in Chemistry ... or Math.—II ...	100
Eighth and Ninth days	10—4	Practical Examination in Physics ... Laboratory note-books in Physics ...	400 200
		Total ...	1,400

BRANCH *ii-B*—CHEMISTRY.

Days	Hours	Subjects	Marks
First day ...	10—1	Chemistry ...	125
Second day...	10—1	Chemistry ...	125
Third ...	10—1	Chemistry ...	125
Fourth day...	10—1	Chemistry ...	125
Fifth day ...	10—1	Optional Subject ...	100
Sixth day ...	10—1	Physics ...	100
Seventh day..	10—4	Practical Examination in Physics ...	100
Eighth and Ninth days	10—4	Practical Examination in Chemistry ... Laboratory note-books in Chemistry ...	400 200
		Total ...	1,400

* Subject to alteration

BRANCH III

(a) *Botany*

Days	Hours	Subjects	Marks
First day ...	10—1	Algae. Fungi and Bryophytes ...	150
Second day...	10—1	Pteridophytes, Gymnosperms and the Morphology of Angiosperms.	150
Third day ...	10—1	Histology, Physiology, Ecology and distribution.	150
Fourth day.	10—1	Systematic Botany, Economic Botany, and General Principles.	150
Fifth day ...	10—1	Practical Examination in the Main Subject.	100
Sixth day ...	10—1	Written Examination in Subsidiary Subject.	150
Seventh day.	10—1	Practical Examination in Main Subject ...	100
Eighth day...	10—1	Written Examination in Subsidiary Subject.	150
Ninth day ...	10—1	Practical Examination in Main Subject...	100
Tenth day ...	10—1	Practical Examination in Subsidiary Subject.	100
		Laboratory Note-books in the Main Subject.	100
		Total ...	1,400

(*b*) *Zoology*.

Days.	Hours.	Subjects.	Marks.
First day ...	10—1	Written Examination in Zoology (Main)—Invertebrata ...	150
Second day.	10—1	Do. do. Invertebrata II.	150
Third day ...	10—1	Do. do. Chordata ...	150
Fourth day.	10—1	Do. do. General Principles	150
Fifth day ...	10—1	Practical Examination in Main Subject.	100
Sixth day ...	10—1	Written Examination in Zoology (subsidiary)—Invertebrata ...	150
Seventh day.	10—1	Practical Examination in main subject.	100
Eighth day.	10—1	Written Examination in Zoology (subsidiary)—Chordata ...	150
Ninth day ...	10—1	Practical Examination in main subject.	100
Tenth day ...	10—1	Practical Examination in subsidiary subject ...	100
		Laboratory note-books in the main subject ...	100
		Total ...	1,400

(c) Geology

Days.	Hours.	Subjects.	Marks.
First day ...	10—1	Written Examination in Main Subject	150
Second day.	10—1	Do. do.	150
Third day ...	10—1	Do. do.	150
Fourth day.	10—1	Do. do.	150
Fifth day ...	10—1	Practical Examination in Main Subject	100
Sixth day ...	10—1	Written Examination in Subsidiary Subject	150
Seventh day.	10—1	Practical Examination in Main Subject	100
Eighth day.	10—1	Written Examination in Subsidiary Subject	150
Ninth day ...	10—1	Practical Examination in Main Subject	100
Tenth day ...	10—1	Practical Examination in Subsidiary Subject	100
		Laboratory note-books in the Main Subject	100
		Total ...	1,400

STATEMENTS OF TABULATED MARKS FOR THE B.A. (HONOURS) DEGREE—FINAL EXAMINATION

THAT WILL BE IN FORCE UNTIL THE EXAMINATION FOR THE B.Sc. (HONOURS) DEGREE IS HELD FOR THE FIRST TIME.

FINAL EXAMINATION—OPTIONAL BRANCHES

Marks	No.	Subject	Branch	NUMBER OF MARKS OBTAINED
	1	Register Number		
450	2	Pure Mathematics	Branch I	
450	3	Applied Mathematics	Branch I	
450	4	Optional Subjects	Branch I	
1,350	5	Total	Branch I	
600	6	Written examination in the Main Subject	Branch II	
600	7	Practical examination and laboratory note-books in the Main Subject	Branch II	
200	8	Subsidiary Subject	Branch II	
1,400	9	Total	Branch II	
600	10	Written examination in the Main Subject	Branch III	
400	11	Practical examination and laboratory note-books in the Main Subject	Branch III	
400	12	Subsidiary Subject	Branch III	
1,400	13	Total	Branch III	
400	14	Logic and Psychology or Ethics	Branch IV	
600	15	General Philosophy, Outlines of European Philosophy, and Outlines of Indian Philosophy.	Branch IV	
400	16	Optional Subject and Essay	Branch IV	
1,400	17	Total	Branch IV	

FINAL EXAMINATION—OPTIONAL BRANCHES—*continued.*

					NUMBER OF MARKS OBTAINED
800	18	History, Economics and Politics—General		Branch V	
400	19	History, Economics and Politics—Special		Branch V	
200	20	Essay		Branch V	
1,400	21	Total		Branch V	
320	22	All papers other than Composition	First Language (Classical)	Branch VI	
80	23	Composition	First Language (Classical)	Branch VI	
320	24	All papers other than Additional Composition	Second Language (Indian Vernacular.)	Branch VI	
80	25	Additional paper on Composition	Second Language (Indian Vernacular.)	Branch VI	
800	26	Total		Branch VI	
500	27	English Language		Branch VII	
650	28	English Literature		Branch VII	
350	29	Special Period or Subject		Branch VII	
1,500	30	Total		Branch VII	
200	31	Comparative Philology and Comparative Grammar		Branch VIII	
600	32	General part		Branch VIII	
600	33	Special part		Branch VIII	
1,400	34	Total		Branch VIII	
200	35	Comparative Philology and Comparative Grammar		Branch IX	
600	36	General part		Branch IX	
600	37	Special part		Branch IX	
1,400	38	Total		Branch IX	
Whether passed or not passed					
If passed, in what class ranked					
Remarks					

APPENDIX XVIII.

Degree of Bachelor of Science,

Regulations which were in force prior to 1931, but will be in force for the examinations of 1932 only.

Undergraduates proceeding to B.Sc. or B.Sc. (Honours)

1. Undergraduates who has passed the Intermediate Examination in Arts and Science and desire to proceed to a degree in Science shall undergo a further course of study varying in length according as they intend to proceed to the Bachelor of Science Degree Examination or to the Bachelor of Science (Honours) Degree Examination.

DEGREE OF BACHELOR OF SCIENCE.

A. *Courses of Study.*

Courses of Stud.

2. For the B.Sc. Degree the course shall extend over a period of two years and shall comprise instruction in

Part I. English

Part II. Any three of the following branches of knowledge one of which shall be a main subject and the other two be subsidiary subjects,

i. Mathematics.
ii. Physics.
iii. Chemistry.
iv. Botany.
v. Zoology.
vi. Geology.

Syllabuses

3. The courses of study shall be as defined in the syllabuses detailed below:—

Part I. English.

(1) Composition. (2) Nineteenth Century Prose as prescribed for candidates for the B.A. Degree.*

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* Old Regulations.

*Part II.

i. Mathematics.

Main.

In addition to the subjects prescribed under (*a*) Mathematics in Group (i) of the Intermediate Examination, the course will comprise Algebra, Plane Trigonometry, Analytical Geometry, Elements of the Calculus, Dynamics and Astronomy.

Pure Mathematics.

Algebra

Inequalities. Limits. Elementary theorems in convergence and divergence of series. The Binomial Theorem for any rational index. Exponential and Logarithmic series. Partial fractions. Elementary methods for the summation of series. Elementary properties of simple continued fractions. Intermediate equations of the first degree. Elementary properties of Determinants.

Typical graphs . $y = axn$, $y = \frac{a}{xn}$, $y = ax + b + \frac{c}{x}$, $y = ax + b + \frac{c}{x^2}$.

Graphical solution of cubic and biquadratic equations.

General properties of the equation of the *n*th degree and its roots and co-efficients. Simple transformations of equations. Reciprocal equations. Approximate solution of numerical equations.

Trigonometry

Fuller treatment of the Intermediate course. Quadrilaterals inscribed in and circumscribed about circles. Regular polygons. Limits of sin x|x and tan x|x as x tends

* For the revised Syllabus *vide* Appendix V.

to zero. De Moivre's theorem and its immediate applications. Summation of elementary trigonometrical series.

Analytical Geometry

The Cartesian equations of the straight line and the circle referred to rectangular axes; the parabola, ellipse and hyperbola referred to their principal axes; and the rectangular hyperbola referred to its asymptotes. The general equation of the second degree. The polar equations of the straight line, circle and the conic. Simple problems on the above.

Calculus

Standard forms and fundamental processes of differentiation and integration. Simple applications of the derivative to geometry, algebra, dynamics and physics. Maxima and Minima values of a function of one variable. Theorem of mean value (graphical proof). Approximations and small errors. Curvature, Cartesian formulæ for the radius of curvature. Integration by substitution. Integration by parts. Integration regarded as summation, with simple applications to areas, volumes and surfaces and to dynamics. Solution of the differential equation of simple harmonic motion.

Applied Mathematics

Dynamics

Resolution and composition of displacements, velocities, and accelerations. Curves of speed and velocity diagrams. Motion of a particle in one plane under constant acceleration. Simple harmonic motion; composition of simple harmonic motions. Angular velocity and angular acceleration: moment of velocity.

Absolute units of force. Resolution and composition of forces. Angular momentum; moments of inertia in simple cases; the pendulum; determination of g. Work, energy, conservation of energy; energy diagrams. Impact;

the ballistic pendulum. Simple cases of the dynamics of strings. Dimensions of dynamical units.

Conditions of equilibrium of a body acted on by forces in one plane. Moments, couples. Centre of mass. The theory of simple machines. Laws of friction. Graphical methods with simple applications.

Astronomy

The apparent motion of the heavens. Circumpolar stars. The principal constellations and the most conspicuous stars.

The celestial sphere.—Points and lines on it. Horizon, zenith, poles, meridian, etc., the equinoctial points, etc.

Celestial co-ordinates.—Right ascension, declination, etc., latitude and longitude.

The transit circle, the equatorial, the clock. The transit theodolite. The sextant and chronometer.

Phenomena depending on change of latitude and longitude of the observer. Magnitude of the earth.

The apparent annual motion of the sun. The constellations of the zodiac. The ecliptic and its obliquity. The equinoxes and the solstices. The earth's motion round the sun. The seasons.

Sidereal time. Apparent solar time. Mean solar time. Equation of time. Standard time (India). Civil and astronomical reckoning. Conversion of time.

Explanation of astronomical refraction and parallax. Twilight.

Determination by observation of clock error and rate of right ascension and declination of a heavenly body, and of the latitude and longitude of a station.

The solar system, and the motion of the planets. Kepler's laws. Comets and meteors.

The motion of the moon and her phases. The plane of her orbit. The nodes and their motion. The moon's sidereal and synodic periods. Her diameter and distance.

Distances and magnitude of the sun, moon and planets.

Cause of the eclipses of the sun and moon. Ecliptic limits. Number of eclipses in a year.

The Calendar. The use of the Nautical Almanac.

Subsidiary.

Same as those prescribed for B.A.

ii. Physics.

Main.

(The treatment of the subjects in the following course will require a knowledge of the simple applications of the calculus) :—

Dynamics	... as in the B.A. (ii-A) Course
Properties of matter	... " "
Hydrostatics	... " "
Heat	... " "
Light	... as in the B. A. (ii-A) Course with 'Achromatism in lens systems' deleted and the following added 'Cardinal points of thick lenses and simple lens systems. Simple cases of astigmatism, spherical and chromatic aberration.'
Magnetism	... as in the B.A. (ii-A) Course
Electricity	... " "
Sound	... " "
Practical Physics	... " "

At the practical examination candidates must submit to the Examiner or Examiners their laboratory note-books duly certified by the professors or lecturers as a *bona-fide* record of work done by the candidates.

Each note-book must be countersigned by the professor or professors under whom the candidate has worked, to certify it to be a *bona-fide* record of work done by the candidate.

ii. Physics.

Subsidiary.

Same syllabus as for B.A. (ii-B) Subsidiary Physics.

iii. Chemistry (Main).

* * * *

Chemistry (Subsidiary).

* * * *

Botany (Main).

* * * *

Botany (Subsidiary).

* * * *

Zoology (Main).

* * * *

Zoology (Subsidiary).

* * * *

Geology (Main).

* * * *

Geology (Subsidiary).

* * *

Vide pages 242—253 of Part II—Vol. I.

B. Examinations.

Eligibility for the Degree

4. (*a*) No candidate shall be eligible for the degree of Bachelor of Science until he has passed the examination in Part I—English and in Part II, viz., three of the optional branches of knowledge contained in the course of study.

Admission to Examination

(*b*) No candidate shall be admitted to the examination unless he has passed the Intermediate Examination in Arts and Science in this University or an examination accepted by the Syndicate as equivalent thereto.

Appearance at Examinations—whole or for parts

5. A candidate for the B.Sc. Degree Examination may present himself for Part I at the end of the first year of the course and thereafter may at his option present himself for the whole or for either Part at any one time.

Failed candidates to produce additional certificate

6. A candidate who fails to pass the examination in Part II on the first occasion on which he presents himself for examination shall produce on the next occasion on which he presents himself for the examination a certificate of having attended in an affiliated college an additional year of instruction in each of the three selected optional branches of knowledge.

7. A candidate shall be declared to have passed Part I of the examination if he obtains not less than 40 per cent of the total number of marks. A candidate shall be declared to have passed Part II of the examination if he obtains not less than 40 per cent of the total marks, and not less than 30 per cent in each of the three selected optional branches of knowledge. All other candidates shall be deemed to have failed in the examination.

Marks qualifying for a pass

There shall be separate lists of the successful candidates in each Part. Candidates obtaining not less than 60 per cent of the total marks in Part I shall be declared to have passed with distinction in English.

Classification of successful candidates.

Successful candidates in Part II shall be arranged in three classes.—The *first*, consisting of those who obtain not less than 60 per cent; the *second*, of those who obtain not less than 50 per cent; and the *third*, of the remainder.

APPENDIX XIX.

Degree of Bachelor of Medicine and Surgery

Regulations which were in force prior to 1928.

1. Candidates for the degree of Bachelor of Medicine and Surgery shall be required—

Age limit for admission to college.

(i) to have completed the age of seventeen years on or before the date of admission to a college of Medicine for registration as a student;

Preliminary qualification.

(ii) to have passed the Intermediate Examination in Arts and Science of this University, taking Group i or ii (Mathematics or Natural Science, Physics and Chemistry), or an examination accepted by the Syndicate as equivalent thereto;

Five years' study at college.

(iii) to have been subsequently engaged for not less than five years in their professional studies in a College of Medicine affiliated to or recognised by the University.

Four Examinations.

2. Candidates shall be required to pass four examinations as hereinafter stated, each held twice a year, in December and April in the case of the First M.B. & B.S. Examination, and April and October in the case of the other examinations.

3. (*a*) Candidates who fail to pass any examinations shall be referred to their studies until the next succeeding examination.

Referred candidates may proceed with higher studies.

(*b*) In the case of the examinations other than the Final, candidates referred at any examination may on the first occasion on which they are so referred proceed with their studies and enter upon the courses prescribed for the next ensuing higher examination, provided that, if any such

candidate should fail to pass the next succeeding examination no period of study so spent in the courses for the next higher examination shall be allowed to count for the grant of the certificates prescribed therefor.

This concession will not, however, apply to candidates for the Second M.B. & B.S. Examination who fail in Part II of the examination.

(*c*) Candidates who have been referred to their studies shall on the first occasion on which they are so referred be admitted to the next succeeding examination without the production of additional certificates.

(*d*) Candidates who have been referred to their studies and who did not appear or who failed at the next succeeding examination shall be admitted to a subsequent examination only on the production of a certificate, in the form hereinafter prescribed, of having been re-engaged in study at a constituent or an affiliated college until the next succeeding examination.

(*e*) Candidates who, not having previously failed at the examination, and having obtained the prescribed certificates did not apply for admission to the next ensuing examination although qualified to do so, or having applied for admission did not appear, shall be treated for purposes of these Regulations as if they had failed at that examination and had been referred to their studies.

FIRST M.B. & B.S. EXAMINATION

Course of study and examination.

4. A candidate for the first M.B. & B.S. examination shall undergo a course of study extending over an academic half-year and shall be examined in—

(*a*) Inorganic Chemistry, according to a Syllabus,

(*b*) Physics, according to a Syllabus, and

(*c*) Biology, according to a Syllabus.

The examination in each subject shall be Written, Practical and Oral.

5. No candidate shall be admitted to this examination unless he has produced satisfactory evidence of having complied with the provisions contained in paras. (i) and (ii) of Regulation I of this Chapter, and has produced the prescribed certificates.

Conditions of admission to examination.

6. Candidates who have passed the Physical or Natural Science Group of the B.A., B.A. (Honours), or B.Sc. Degree Examination of this University or of any other Indian University accepted by the Syndicate as equivalent thereto shall not, however, be required to produce the prescribed certificates for, or to pass in, any of the subjects laid down for this examination in which they may have already passed at the examination for their respective degrees.

Candidates for B.A, B. Sc., etc, passing in Science Group eligible for exemption.

7. A candidate for the First M.B. & B.S. Examination shall be declared to have passed the examination if he obtains not less than one-third of the marks in the written, and not less than one-third of the marks in the practical and oral taken together in each subject, and not less than one-half of the aggregate number of marks. All other candidates shall be deemed to have failed in the examination.

Marks qualifying for a pass.

Candidates who obtain partial exemption under Regulation 6 of this Chapter may be declared to have passed the First M.B. & B.S. Examination—

Conditions of success imposed upon candidates obtaining partial exemption.

(*a*) in the case of a candidate who is exempted in two out of the three subjects; if he obtains not less than one-half of the maximum number of marks allotted to the third subject;

(*b*) in the case of a candidate who is exempted in only one out of the three subjects, if he obtains not less than one-third of the maximum marks in each of the remaining two subjects and not less than one-half of the total maximum marks for both.

Conditions of obtaining exemption.

8. Candidates for the First M.B. & B.S. Examination who fail in not more than one subject and who obtain not less than one-half of the aggregate number of marks in the whole examination, may, at the option of the candidates, be exempted, from re-examination in the subjects in which they have passed.

9. Candidates for the First M.B. & B.S. Examination who pass the whole examination at one time shall be ranked in the order of proficiency as determined by the total marks obtained by each and shall be arranged in two classes:—

Classification of successful candidates for the M.B.

The first, consisting of those who have obtained not less than two-thirds of the aggregate number of marks.

The second, consisting of all others.

Candidates who pass in the first class and who obtain not less than seventy-five per cent. of the marks in any subject shall be declared to have passed with distinction in that subject.

All candidates who pass the examination in parts shall be ranked in the second class.

SECOND M.B. & B.S. EXAMINATION

Course of study and examination

10. A candidate for the Second M.B. & B.S. Examination shall undergo a course of study extending over one and a half-years and shall be examined in—

(a) Organic Chemistry including Bio-Chemistry—according to a Syllabus.

(b) Physiology.

(c) Anatomy, including the Elements of Human Embryology.

The examination in each subject shall be Written, Practical and Oral.

Examination in Parts

11. Candidates may present themselves for the whole examination at one time, or may take the examination in two parts, *viz.*, Part I comprising Organic Chemistry including Bio-Chemistry, and Part II comprising Anatomy including the Elements of Human Embryology, and Physiology.

Conditions of admission to Part I.

12. No candidate shall be admitted to Part I of the examination unless he has passed the First M.B. & B.S. examination or an examination accepted by the Syndicate as equivalent thereto, and has produced the prescribed certificates.

Conditions of admission to Part II

13. No candidate shall be admitted to Part II of the examination unless he has complied with the provisions of Regulation 12 of this Chapter, and has produced the prescribed further certificates.

Conditions of admission to whole Examination

14. No candidate shall be admitted to the whole Examination, unless he has complied with all the provisions of Regulations 12 and 13 of this Chapter.

Marks qualifying for a pass in Second M. B. & B. S. Whole Examination

15. A candidate for the whole Examination shall be declared to have passed the examination if he obtains not less than one-half of the marks in Anatomy (including Elements of Human Embryology (written), and Physiology (written) respectively, not less than one-half of the marks in the Practical and Oral taken together in Anatomy (including Elements of Human Embryology), and Physiology respectively, not less than one-third of the marks in Organic Chemistry including Bio-Chemistry, and not less than one-half of the aggregate number of marks. All other candidates shall be deemed to have failed in the examination.

16. A candidate for the Second M.B. & B.S. Examination taken in parts shall be declared to have passed in Part I of the examination taken alone if he obtains not less than one-half of the marks in Organic Chemistry including Bio-Chemistry; and to have passed in Part II of the examination taken alone if he obtains respectively not less than one-half of the marks in Anatomy including Elements of Human Embryology (written), in Physiology (written), and in the Practical and Oral taken together in each subject. All other candidates shall be deemed to have failed in the Parts of the Examination taken alone.

Marks qualifying for a pass in Part

17. Candidates for the Second M.B. & B.S. Examination who fail in only one subject, and who obtain not less than one-half of the aggregate number of marks in the whole examination may, at the option of the candidates, be exempted from re-examination in the subjects in which they have passed.

Conditions of obtaining exemption

18. Successful candidates at the Second M.B. & B.S. Examination shall be ranked in the order of proficiency as determined by the total marks obtained by each and shall be arranged in two classes:—

Classification of successful candidates for M.B.

The first, consisting of those who have obtained not less than two-thirds of the aggregate number of marks.

The second, consisting of all others.

Candidates who pass in the first class and who obtain not less than seventy-five per cent. of the marks in any subject shall be declared to have passed with distinction in that subject.

No candidate shall be ranked in the first class unless he has either passed the whole examination at one time or has passed each Part separately on the first occasion of appearing therefor.

THIRD M. B. & B. S. EXAMINATION

Course of study and examination

19. A candidate for the Third M.B. & B.S. examination shall undergo a course of study extending over one year, and shall be examined in.

(a) Materia Medica,

(b) General Pathology and

(c) Hygiene.

The examination in each subject shall be Written, Practical and Oral.

Conditions of admission to examination

20. No candidate shall be admitted to the Third M.B. & B.S. Examination unless he has passed the Second M.B. & B.S. Examination or an examination accepted by the Syndicate as equivalent thereto, and has produced the prescribed certificates.

Marks qualifying for a pass

21. A candidate for the Third M.B. & B. S. Examination shall be declared to have passed the examination if he obtains not less than one-half of the marks in the written part of each of General Pathology and Hygiene, and not less than half of the marks in the Practical and Oral taken together in each of those two subjects, and not less than one-third of the marks in the Written, Practical and Oral examinations taken together in Materia Medica, and not less than one-half of the aggregate number of marks. All other candidates shall be deemed to have failed in the examination.

Conditions of obtaining exemption

22. Candidates for the Third M.B. & B.S. Examination who fail in not more than one subject, and who obtain not less than one-half of the aggregate number of marks in the whole examination may, at the option of the candidates, be exempted from re-examination in the subjects in which they have passed.

Classification of successful candidates

23. Candidates for the Third M.B. & B.S. Examination who pass the whole examination at one time shall be ranked in the order of proficiency as determined by the total marks obtained by each, and shall be arranged in two classes:—

The first, consisting of those who have obtained not less than two-thirds of the aggregate number of marks.

The second, consisting of all others.

Candidates who pass in the first class and who obtain not less than seventy-five per cent. of the marks in any subject shall be declared to have passed with distinction in that subject.

All candidates who do not pass the whole examination at one time shall be ranked in the second class.

FINAL M.B. & B.S. DEGREE EXAMINATION

Examination in Parts

24. (i) Candidates may present themselves for the whole examination at one time or may take the examination in two parts.

Courses of study and examination

(ii) A candidate for Part I of the Final M.B. & B.S. Degree Examination shall undergo a course of study extending over one year, and shall be examined in—

(a) Ophthalmology, and

(b) Medical Jurisprudence.

(iii) A candidate for Part II of the Final M. B. & B.S. Degree Examination shall undergo a course of study extending over two years, and shall be examined in—

(a) Medicine including Therapeutics, Mental diseases, (according to a Syllabus), and Acute Infectious Diseases.

(b) Surgery and Surgical Anatomy, and

(c) Midwifery and Diseases of women and the New born child.

The course for Practical Midwifery required for the M.B. & B.S. Degree shall be as under—

(1) Every candidate for the M.B. & B.S. Degree before commencing the study of Practical Midwifery, shall have held the offices of Clinical Medical Clerk and Surgical Dresser and shall have attended a course of lectures on Surgery and Midwifery.

(2) Every candidate shall be required to present a certificate bearing that he has conducted twenty cases of labour under official medical supervision subject to the following conditions, viz., either.

(a) That he has previously given regular attendance for a period of three months upon the in-door practice of a Lying-in-hospital or the Lying-in-wards of a General Hospital, and has received practical instruction therein under the supervision of a Medical Officer:

or

(b) That he has previously given regular daily attendance for a period of one month upon the in-door practice of a Lying-in-hospital, or the Lying-in-wards of a General Hospital and that he has conducted cases of labour therein, and has been certified by the instructor as competent to conduct out-door cases under official medical supervision.

(3) The certificate that the candidate has conducted the above-mentioned twenty cases of labour should be given by a member of the staff of a Lying-in-hospital or of a Meternity Charity recognized by the University of Madras.

(iv) The examination in each subject shall be Written, Practical, and Oral in the case of Part I, and Written, Clinical, Practical and Oral in the case of Part II.

Conditions of admission to Part I

25. No candidate shall be admitted to Part I of the examination unless he has passed the Third M.B. & B.S. Examination or an examination accepted by the Syndicate as equivalent thereto, and has produced the prescribed certificates.

Conditions of admission to Part II

26. No candidate shall be admitted to Part II of the examination unless he has passed not less than three years previously the Second M.B. & B.S. Examination, and has complied with all the provisions of Regulation 25 of this Chapter, and has produced the prescribed further certificates.

Conditions of admission to Whole Examination

27. No candidate shall be admitted to the whole examination unless he has complied with all the provisions of Regulations 25 and 26 of this Chapter.

Marks qualifying for the M.B. Degree

28. A candidate for the Final M.B. & B.S. Degree Examination shall be declared to have passed the examination if he obtains not less than one-half of the marks in Ophthalmology and in Medical Jurisprudence respectively, and not less than one-half of the marks in the written part of each of the remaining subjects, not less than one-half of the marks in Clinical and Oral Medicine taken together, in Clinical and Oral Surgery taken together, in Operative Surgery, and in Clinical and Practical and Oral Midwifery, etc., taken together. All other candidates shall be deemed to have failed in the examination.

Marks qualifying for a pass in Parts

29. A candidate for the Final M.B. & B.S. Degree Examination shall be declared to have passed in Part I of the examination taken alone if he obtains not less than one half of the marks in each subject.

A candidate for the Final M.B. & B.S. Degree Examination shall be declared to have passed in Part II of the examination taken alone if he obtains

not less than one-half of the marks in each subject. All other candidates shall be deemed to have failed in the parts of the examination taken alone.

Classification of successful candidates

30. Successful candidates at the Final M.B. & B.S. Degree Examination shall be ranked in the order of proficiency as determined by the total marks obtained by each, and shall be arranged in two classes:—

The first, consisting of those who have obtained not less than two-thirds of the aggregate number of marks.

The second, consisting of all others.

Candidates who pass in the first class and who obtain not less than seventy-five per cent. of the marks in any subject shall be declared to have passed with distinction in that subject.

No candidate shall be ranked in the first class unless he has either passed the whole examination at one time or has passed each Part separately on the first occasion of appearing therefor obtaining not less than two-thirds of the marks in each part.

Appearance only in the subject or subjects failed

31. A candidate appearing for the Final M.B. & B.S. Degree Examination who has previously obtained the passing marks in a subject or subjects shall only be required to appear in the subject or subjects in which he has previously failed.

Syllabus

INORGANIC CHEMISTRY FOR THE FIRST M. B. & B. S. EXAMINATION

Candidates will be expected to understand the elements of Chemistry included in the syllabus for the Chemistry part of the Intermediate Examination, and in addition to have an elementary knowledge of the following subjects:—

The general properties of solids, liquids and gases.

The gas laws and the kinetic theory of gases.

The general properties of solutions, including osmotic pressure and the methods of measuring it, both direct and indirect.

Electrolysis and the theory of ionic dissociation, including the theory of hydrogen-ion concentration and its measurement.

The law of mass action and its application to chemical equilibriums.

Calloids, including the effect of surface on chemical actions.

Catalysis and the general conditions of catalytic actions.

Some elementary ideas on the constitution of matter, the classification of the elements and radioactivity.

Practical Examination

Candidates will be expected—

to be familiar with the ordinary materials and apparatus used in laboratories, and with such operations as filtration, solution, distillation, drying, precipitation, crystallisation, and extraction with immiscible solvents;

to be familar with the use of a chemical balance and the use and calibration of graduated flaskes, pipettes and burettes;

to do easy preparations of inorganic substances;

to purify or to make an intelligent attempt to purify a known substance;

to perform simple quantitative exercises, such as the determination of melting points, boiling points, densities, and the determination of the amount of water in a substance or of the amount of ash left on the ignition of a substance;

to perform any easy gravimetric estimation, for example, a sulphate as BASO carbon dioxide by direct weighing, choride-ion as AgCl, calcium as CaO;

to prepare and use in simple volumetric estimations standard solutions of acids, alkalies, permanganate, iodine, thiosulphate and silver nitrate;

to determine the approximate hydrogen-ion concentration of a given solution by means of indicators;

to attack with intelligence any simple chemical problem, such, for example, as the separation of two known substances and the preparation of a standard solution of a substance that cannot be weighed.

The Examiners will use their discretion as to whether or not books may be allowed for the whole or part of the practical examination.

PHYSICS FOR THE FIRST M.B. & B.S. EXAMINATION

Candidates will be expected, in addition to the portions contained in the Physics syllabus of the Intermediate examination, to have an elementary knowledge of the following subjects:—

General.—Units of measurement and the measurement of small intervals of time.

The general properties of the three states of matter.

Periodic motion.

Surface energy and capillarity.

The gas laws and the kinetic theory of matter, including the theory of heat.

Heat.—Elements of meteorological physics.

Radiation.

Sound.—The theory of sound.

Sound producing and sound receiving instruments.

Light.—Elements of the wave theory of light including interferences, diffraction and polarisation.

The microscope in some detail.

Thick lenses.

The photographic camera, the spectroscope and the polarimeter.

Magnetism and Electricity.—Electrostatic instruments.

The capillary electrometer.

The thermopile.

Induced currents and Ruhmkorff's coil.

Some of the commonly used electrical appliances, such as the telephone, and the electric lamp.

Phenomena accompanying the passage of a current through vacuum tubes. X-rays. X-ray photography and X-ray spectra.

Candidates will be expected to have a practical knowledge of, and perform simple experiments in connection with the following subjects:—

General.—Length measurements, using verniers, micrometer screws, etc. Simple experiments with the pendulum.

The determination of the specific gravity of solids and liquids by the balance and by hydrometers.

The barometer and the corrections to be applied to it. Simple experiments on surface tension and capillarity.

Heat.—The determination of the fixed points of a thermometer and the comparison of thermometers.

The measurement of the expansion of solids, liquids and gases and the verification of the equation pv=RT.

Calorimetry and the method of mixtures.

Hygrometers.

The laws of cooling.

Sound.—The sonometer to investigate the vibration of strings.

The resonance column to determine the velocity of sound.

Light.—Experiments on the reflection of light from plane and curved surfaces, and the refraction of light at plane surfaces and through prisms.

The use of the spectroscope.

The determination of the optical constants of thin lenses.

The use of compound lenses and the microscope.

The use of the polarimeter.

Magnetism and Electricity.—The determination of the earth's magnetic field.

The use of simple galvanometers.

The measurement of resistance by Wheatstone's bridge and of electromotive force by the potentiometer.

Experiments illustrating the laws of electrolysis.

The use of a thermo-couple.

Organic Chemistry (Including Biochemistry)

The examination in Organic Chemistry shall comprise the following:—

The ultimate analysis of organic compounds and estimation of carbon, hydrogen, nitrogen, sulphur, phosphorus and the halogens.

The determination of empirical molecular and structural formulæ, and of molecular weights of organic substances.

Isomerism and stereoisomerism.

The constitution and most important reactions and relationships of the following groups of compounds, illustrated in each case by a reference to a few of their more important members:—

Aliphatic series:—Paraffins. Unsaturated hydrocarbons. The different classes of alcohols and their derivatives. Halogen and nitro derivatives, of the hydrocarbons. Aldehydes. Ketones. Acids. Esters. Fats. Amines. Phosphines. Arsines. Amino-acids, Carbohydrates, sugars, starches, glucosides. Amides, cyanides, Urea, Purins.

Aromatic series:—The hydrocarbons and their simple derivatives Benzyl alcohol, benzoic acid, salicylic acid, gallic and tannic acids, phthalic acids.

Some elementary knowledge of the constitution so far as it is known, and the important reactions of—

The proteins. Creatnine and creatine. Bile acids and cholestorol. The alkaloids. An Elementary knowledge of the following subjects:—Enzymes and their modes of action. Fermentation. The composition of food stuffs, and their fate in the body. The constituents of the blood, including blood gases. Respiratory exchange. Urine. Metabolism. The Ewald test meal.

Practical Work.

The detection of the following elements:—Carbon, hydrogen, nitrogen, sulphur, phosphorus, iron and the halogens.

The preparation and hydrolysis of an ester, and of an amide.

The preparation of a fatty acid from a fat. The determination of the molecular weight of a fatty acid by titration.

The preparation of ozazones.

The estimation of—

Nitrogen by Kjeldahl's method.

Urea by the hypobromite and urease methods.

Glucose, lactose, and cane sugar volumetrically and polarimetrically.

The detection of the constituents of food. The action of digestive juices on foods.

The action of rennet on milk. The reactions of bile pigments and bile salts.

The absorption spectra of hæmoglobin and its derivatives. The preparation of hæmin. The estimation of hæmoglobin. Experiments on blood coagulation and hæmolysis.

The detection and estimation of the principal normal and abnormal constituents of urine.

The estimation of sugar in blood.

The preparation of collodion sacs.

Simple experiments on colloids.

The practical use of buffer solutions.

The estimation of hydrogen-ion concentration calorimetrically.

Candidates will be required to bring to the practical examination note-books containing record of their previous practical work. These note-books must be certified by the teachers of the candidates as being the actual working notes made by them in the laboratory.

(Examiners will use their discretion as to whether or not the candidates may be allowed books for the whole or part of the practical examination.)

BIOLOGY

The examination in *Biology* shall comprise the subjects included in the following syllabus, which is intended only to indicate its general scope and character:—

A. *General Biology.*

The distinctive properties of living and non-living matter.

The properties of protoplasm.

The cell. Cell division.

Tissues and organs. Division of physiological labour and differentiation of structure.

The differences between animals and plants.

B. *Botany.*—

The structure, life history, and physiology of yeast, Bacteria, Penicillium or other mould, Spirogyra Chara, fern.

The elements of the morphology and physiology of the Angiosperms embracing (*a*) the structure (macroscopic and microscopic) of the root, stem and leaf; (*b*) the structure of a typical flower and modifications of the type; (*c*) the inflorescence, and the principal types of branching; (*d*) the structure and development of the seeds and embryo; (*e*) the principal types of fruits; (*f*) the dispersal of seeds and fruits; (*g*) the main facts in relation to nutrition, growth and reaction to environment.

The reproduction and life-history of Angiosperms.

C. *Zoology.*—

The structure, life-history, and physiology of Amoeba, Paramœcium, Hydra, earthworm, cockroach, frog, guinea-pig (only an elementary knowledge of the muscular system of the frog and of the muscular and nervous systems of the guinea pig will be required).

An elementary knowledge of the more important types of animal parasites. The general characters of the animal tissues. The leading types of reproduction in animals. The segmentation of the ovum in Amphioxus, frog, fowl, and guinea-pig.

D. Variation, heredity, natural selection and evolution treated in an elementary manner.

Practical Examination.

Each candidate must be prepared to examine microscopically to dissect, and to describe specimens or parts of the animal and plants enumerated in the foregoing syllabus, with the exception that for the skull of the guinea-pig will be substituted that of the dog.

TIME-TABLE FOR EXAMINATIONS.

FIRST M.B. & B.S. EXAMINATION.

Days	Hours	Subjects	Marks
First day ..	10—1	Chemistry (written)	100
	2—5	Physics (do.)	100
Second day...	10—1	General Biology (Written)	100
Days and hours will be duly notified		Chemistry (Practical)	50
		Physics (do.)	50
		General Biology (Practical)	50
		Chemistry (Oral)	50
		Physics (Oral)	50
		General Biology (Oral)	50

SECOND M.B. & B.S. EXAMINATION

Days	Hours	Subjects	Marks
First Day	10—1	Organic Chemistry including Bio-Chemistry (Written)	50
	2—5	Physiology (Written)	100
Second day...	10—1	Anatomy including Elements of Human Embryology (Written)	100
Days and hours will be duly notified		Organic Chemistry including Bio-Chemistry (Practical)	50
		Do. (Oral)	50
		Anatomy including Elements of Human Embryology (Dissections)	50
		Physiology, including Histology and Chemical Physiology (Practical and Oral)	100
		Anatomy including Elements of Human Embryology (Oral)...	50

THIRD M.B. & B.S. EXAMINATION

Days	Hours	Subjects	Marks
First Day ...	10—1 2—5	Materia Medica (Written) ... ... General Pathology (do.)... ...	50 100
Second day ...	10—1	Hygiene (Written)	100
Days and hours will be duly notified.		Materia Medica (Oral) ... ... Practical Pharmacy... ... ... General Pathology (Practical) ... Do. do. (Oral) ... ... Hygiene (Practical & Oral)	30 20 50 50 50

FINAL M.B. & B.S. DEGREE EXAMINATION.

Days	Hours	Subjects	Marks
First day ...	10—1 2—5	Medicine including Therapeutics and Mental Diseases (Written) ... ... Ophthalmology (Written)	100 50
Second day...	10—1 2—5	Surgery and Surgical Anatomy (Written) Medical Jurisprudence (Written) ...	100 100
Third day ...	10—1	Midwifery and Diseases of Women and the New-born Child (Written) ...	100
Days and hours will be duly notified.		Clinical Medicine ... ... Medicine (Oral) ... ... Clinical Surgery ... ... Surgery (Oral) ... ... Operative Surgery ... ... Midwifery, etc., (Clinical, Practical and Oral) ... ... Ophthalmology (Practical and Oral) ... Medical Jurisprudence (Oral) ...	150 50 150 50 50 100 50 50

FORMS OF ANNUAL CERTIFICATES.

FIRST M.B.. & B.S. EXAMINATION.

I certify that to the best of my knowledge and belief........ ....completed the age of seventeen years on or before the date of admission to the Medical College..............that he has been engaged in medical studies for not less than an academic half year, and that his progress and conduct have been satisfactory.

Date................

(Signature)

Principal, Medical College.

I certify that............has attended a course of lectures on Inorganic Chemistry and a course of instruction in Practical Chemistry.

Date................

(Signature)

Professor of Chemistry.

I certify that..............has attended a course of Experimental Physics, including Practical Physics.

Date................

(Signature)

Professor of Physics.

I certify that............has attended a course of General Biology Theoretical and Practical.

Date................

(Signature)

Professor of Biology.

SECOND M.B. & B.S. EXAMINATION.

PART I

I certify that........has been engaged in medical studies of the Medical College..............for not less than six months subsequently to passing or after completing and receiving the certificate for the course prescribed for the First M.B. & B.S. Examination, and that his progress and conduct have been satisfactory.

Date................

(Signature)

Principal, Medical College.

I certify that............has attended a course of lectures on Organic Chemistry including Bio-Chemistry and a course of instruction in Practical Organic Chemistry including Bio-Chemistry.

Date................

(Signature)

Professor of Chemistry.

PART II

I certify that............has been engaged in medical studies at the Medical College...........for not less than one and a half years subsequently to passing or after completing and receiving the certificates for the course prescribed for the First M.B. & B.S. Examination, and that his progress and conduct have been satisfactory.

Date................

(Signature)

Principal, Medical College.

I certify that............has attended a course of instruction in Anatomy including Elements of Human Embryology, Theoretical and Practical.

Date................

(Signature)

Professor of Anatomy.

I certify that.............has dissected for twelve months during the regular sessions and has completed the dissection of the human body.

Date................

(Signature)

Professor of Anatomy.

I certify that...........has attended a course of lectures on Physiology and a course of instruction in Practical Physiology including Histology, and Chemical Physiology.

Date................

(Signature)

Professor of Physiology.

THIRD M.B. & B.S. EXAMINATION.

I certify that..........has been engaged in medical studies at the Medical College.............for not less than one year after passing the Second M.B. & B.S. Examination, and that his progress and conduct have been satisfactory.

Date................

(Signature)

Principal, Medical College.

I certify that...........has attended a course of lectures on General Pathology and a course of instruction in Practical Pathology including Bacteriology.

Date................

(Signature)

Professor of Pathology.

I certify that.........has attended a course of lectures on Hygiene and a course of instruction in Practical Hygiene.

Date ....

(Signature)

Professor of Hygiene.

I certify that............has attended a course of lectures on Materia Medica and a course of instruction in Practical Pharmacy.

Date................

(Signature)

Professor of Materia Medica.

I certify that............has attended a course of instruction in Minor Surgery.

Date................

(Signature)

Professor of Surgery.

I certify that............has attended the medical practice of the............Hospital for a period of three months and lectures on Clinical Medicine during such attendance.

(Signature)

Physician..........Hospital.

I certify that............has attended the surgical practice of the ....Hospital for a period of three months and lectures on Clinical Surgery during such attendance.

(Signature)

Date................

Surgeon,............Hospital.

I certify that..........has attended the out-patient department of the.............Hospital for a period of three months.

(Signature)

Date................

Medical Officer.

I certify that............has been engaged in post mortem room clerking for a period of one month.

(Signature)

Date..............

Professor of Pathology.

FINAL M.B. & B.S. DEGREE EXAMINATION.

PART I

I certify that..........has been engaged in medical studies at the Medical College..........for not less than one year subsequently to passing or after completing and receiving the certificates for the course prescribed for the Third M.B. & B.S. Examination, and that his progress and conduct have been satisfactory.

(Signature)

................19 .

Principal, Medical College...........

I certify that..........has attended a course of lectures on Medicine, including Therapeutics.

(Signature)

................19 .

Professor of Medicine.

I certify that..........has attended a course of lectures on Surgery.

(Signature)

................19 .

Professor of Surgery.

I certify that, before commencing the study of Practical Midwifery...........has attended courses of lectures on Surgery and on Midwifery and Diseases special to women and the new born child.

(Signature)

Professor of Midwifery.

I certify that..........has attended a course of lectures on Medical Jurisprudence.

(Signature)

................19 .

Professor for Medical Jurisprudence.

I certify that..........has attended a course of lectures on Ophthalmology.

(Signature)

................19 .

Professor of Ophthalmology.

I certify that..............has attended the medical practice of.............Hospital for three months, and lectures on Clinical Medicine during such attendance.

(Signature)

................19 .

Surgeon,............Hospital.

I certify that............has attended the surgical practice of the..............Hospital for three months, and lectures on Clinical Surgery during such attendance.

(Signature)

................19 .

Surgeon,............Hospital.

I certify that.............has attended the practice of the ....Hospital for three months.

(Signature)

................19 .

Professor of Ophthalmology.

I certify that..............has been engaged in post-mortem room clerking for a period of two months.

(Signature)

................19 .

Professor of Pathology.

I certify that................has worked in the out-patient department of the..............Hospital for a period of three months.

(Signature)

................19 .

Medical Officer.

PART II.

I certify that................has been engaged in Medical studies at the Medical College.............for an additional year subsequently to passing or after completing and receiving the certificates for the course prescribed for Part I of the Final M.B. & B.S. Examination, that a period of three years has intervened between the date of passing the Second M.B. & B.S. Examination and that of admission to the Final M.B. & B.S. Degree Examination, and that his conduct and progress have been satisfactory.

(Signature)

................19 .

Principal, Medical College.

I certify that............has attended a course of instruction in Acute Infectious Diseases and that he has attended the Infectious Diseases Hospital for a period of two months and that he has attended not less than twice weekly during that period.

(Signature)

................19 .

Medical Officer,

............Hospital.

I certify that............has attended a course of instruction in Operative Surgery.

(Signature)

................19 .

Professor of Surgery.

I certify that........has attended a course of lectures on Mental Diseases.

................19 .

Professor of Mental Diseases.

I certify that............has attended a series of eight Clinical Demonstration in Mental Diseases at a Mental Hospital of not less than fifty beds.

................19 .

Superintendent,

................Mental Hospital.

I certify that............is qualified to perform Vaccination.

....

............19 . *Deputy Inspector of Vaccination.*

I certify that...........has attended a course of practical instruction in the administration of anoesthetics and has personally administered a general anoesthetic in at least six cases.

................19

Physician or Surgeon,

..............Hospital.

I certify that in addition to the periods prescribed for Part I of the Final M.B. & B.S. Examination...........has attended the Medical and Surgical Practice of the............Hospital during the fifth year of the course for the M.B. & B.S. Degree, for a period of six months.

................19 .

Senior Medical Officer.

..............Hospital.

I certify that.......................... has regularly attended / daily attended the practice of the.....................Hospital for a period of three months / one month.

(Signature)

Professor of Midwifery.

I certify that............has personally attended.......... cases of labour under my supervision, of which.................. cases were conducted by him in my presence; also that, under my supervision, he attended in the cases enumerated during the puerperal period.

Medical Officer,

Hospital.

M.B. & B.S. EXAMINATION.

Certificate of Further Study.

I certify that..............has been re-engaged in medical studies for the............Examination....................... subsequently to his appearance at that examination in.......... when he was referred to his studies by the Examiners, until the next succeeding examination, and that his progress and conduct have been satisfactory.

Date................

Signed.....................

Principal.

Medical College.

(1) First M.B. & B.S. Examination

Register Number					
Appearing for whole examination or in part or subjects					
Passing Marks		Part or subjects in which exemption has been granted			NUMBER OF MARKS OBTAINED
33	100	Written ...	100	Chemistry	
33	100	Practical ...	50	Chemistry	
		Oral ...	50	Chemistry	
33	100	Written ...	100	Physics	
33	100	Practical ...	50	Physics	
		Oral ...	50	Physics	
33	100	Written ...	100	General Biology	
33	100	Practical ...	50	General Biology	
		Oral ...	50	General Biology	
300	600	Total Number of Marks obtained			
Whether passed or failed					
If passed, in what class ranked— Class I ... 400 Class II ... 300					
Subjects, if any, in which distinction gained					
Subjects, if any, in which exemption now earned					
Remarks					

(2) Second M.B. & B.S. Examination

Register Number				
Appearing for whole examination or in part or subjects				
Passing Marks	Part or subjects in which exemption has been granted			
				NUMBER OF MARKS OBTAINED
50 *	150	Written ... 50		Organic with Bio-Chemistry.
		100	Practical and Oral	
50	100	Written ... 100		Physiology.
50	100	Oral and Practical ... 100		
50	100	Written ... 100		Anatomy including Elements of Human Embryology
50	100	Dissections ... 50		
		Oral ... 50		
275	550	Total Number of Marks obtained		
Whether passed or failed				
If passed, in what class ranked— Class I ... 367 | Class II ... 275				
Subjects, if any, in which distinction gained				
Subjects, if any, in which exemption earned				
Remarks				

*Candidates appearing in Part I only must obtain 75 marks.

(3) Third M.B. & B.S. Examination

Register Number

Appearing for whole examination or in part or subjects

Passing Marks		Part or subjects in which exemption has been granted	NUMBER OF MARKS OBTAINED
33	100	Written ... 50 Practical ... 20 Oral ... 30	Materia Medica, and Practical Pharmacy
50	100	General Pathology (Written) ... 100	
50	100	Practical ... 50 Oral ... 50	Pathology and Bacteriology (Practical and Oral)
50	100	Written ...100	Hygiene
25	50	Practical and Oral 50	Hygiene
225	450	Total Number of Marks obtained	

Whether passed or failed

If passed, in what class ranked—

Class I ... 300 | Class II ... 225

Subject, if any, in which distinction gained

Subject, if any, in which exemption now earned

Remarks

(4) Final M.B. & B.S. Degree Examination

NUMBER OF MARKS OBTAINED

Register Number				
Appearing for whole examination or in part or subjects				
Passing Marks	Part or subjects in which exemption has been granted			
33	100	Written ... 50 Practical and Oral ... 50	Ophthalmology	PART I
50	150	Written ... 100 Oral ... 50	Medical Jurisprudence	PART I
125	Total in Part I ... 250			PART I
Whether passed or failed in Part I				
50	100	Medicine including Therapeutics and Mental Diseases (Written) ... 100		PART II
100	200	Medicine (Clinical) ... 150 Medicine (Oral) ... 50		PART II

(4) Final M.B. & B.S. Degree Examination—*contd.*

50	100	Surgery and Surgical Anatomy (Written) ... 100		Part II—*contd.*	Number of Marks obtained—*contd*
100	200	Surgery (Clinical) ... 150		Part II—*contd.*	Number of Marks obtained—*contd*
		Surgery (Oral) ... 50		Part II—*contd.*	Number of Marks obtained—*contd*
25	50	Operative Surgery ... 50		Part II—*contd.*	Number of Marks obtained—*contd*
50	100	Written ... 100	Midwifery, etc.	Part II—*contd.*	Number of Marks obtained—*contd*
50	100	Clinical, Practical and Oral ... 100	Midwifery, etc.	Part II—*contd.*	Number of Marks obtained—*contd*
425	Total in Part II ... 850				Number of Marks obtained—*contd*
Whether passed or failed in Part II					Number of Marks obtained—*contd*
550	1,100	Total Number of Marks obtained			Whole Examination
Whether passed or failed					Whole Examination
If passed, in what class ranked— Class I ... 733 | Class II ... 550					Whole Examination
Subjects, if any, in which distinction gained					
Subjects, if any, in which exemption now earned					
Remarks					

i

FIRST M.B. & B.S.

Name	English	
	Vernacular	
Age and date of birth		
Name and occupation of father or guardian		
Race (*i.e.*, nation, tribe, etc.)		
Religion		
Address		
Date of passing the Intermediate or B.A. or B.Sc., or B.A. (Hons.) Degree Examination		
College or colleges at which candidate has studied Physics and Chemistry and Biology, and time at each		
Subjects in which the candidate has obtained exemption under the Regulations and in which he does not propose to appear		
Occasions, if any, on which the candidate previously appeared for the examination		
The period for which the candidate was referred to his studies, on each occasion of previous appearance at the examination		
Signature of Principal of College which candidate is attending at date of application		

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SECOND M. B. & B.S.

Name	English	
	Vernacular	
Age and date of birth		
Name and occupation of father or guardian		
Race (*i.e.*, nation, tribe, etc.)		
Religion		
Address		
Date of passing the First M.B. & B.S. Examination		
College or colleges at which candidate has prosecuted his medical studies since completing his course for the First M.B. & B.S. Examination and time at each		
The Part or Parts in which the candidate proposes now to appear. If the candidate is not required to appear in Part I, the date of passing in that Part		
If appearing for Part II only, the subjects in which he has obtained exemption (and the date of such exemption), and in which he does not propose to appear		
If appearing for the whole examination, the subjects in which he had obtained exemption (and the date of such exemption), and in which he does not propose to appear		
Subjects in which the candidate has obtained exemption under the Regulations and in which he does not propose to appear		
Occasions, if any, on which the candidate previously appeared for the examination		
The period for which the candidate was referred to his studies, on each occasion of previous appearance at the examination		
Signature of Principal of College which candidate is attending at date of application		

iii

THIRD M.B. & B.S.

Name	English	
	Vernacular	
Age and date of birth		
Name and occupation of father or guardian		
Race (*i.e.*, nation, tribe, etc.)		
Religion		
Address		
Date of passing the Second M.B. & B.S. Examination		
College or colleges at which candidate has prosecuted his medical studies since completing his course for the Second M.B. & B.S. Examination and time at each		
Subjects in which candidate has obtained exemption under the Regulations and in which he does not propose to appear		
Occasions, if any, on which the candidate previously appeared for the examination		
The period for which the candidate was referred to his studies, on each occasion of previous appearance at the examination		
Signature of Principal of College which candidate is attending at date of application		

iv

FINAL M.B. & B.S.

Name	English	
	Vernacular	
Age and date of birth		
Name and occupation of father or guardian		
Race (*i.e.*, nation, tribe, etc.)		
Religion		
Address		
Date of passing the Third M.B. & B.S. Examination	Date of passing Anatomy and Physiology in the 2nd M.B. & B.S. Examination	
College or colleges at which candidate has prosecuted his medical studies since completing his course for the Third M.B. & B.S. Examination, and time at each		
The Part or Parts in which the candidate proposes now to appear. If the candidate is not required to appear in Part I, the date of passing in that Part		
If appearing for Part II only, the subjects in which he has obtained exemption (and the date of such exemption), and in which he does not propose to appear		
If appearing for the whole examination the subjects in which he has obtained exemption (and the date of such exemption), and in which he does not propose to appear		
Occasions, if any, on which the candidate previously appeared for the examination		
The period for which the candidate was referred to his studies, on each occasion of previous appearance at the examination		
Signature of Principal of College which candidate is attending at date of application		

APPENDIX XX.

UNIVERSITY PUBLICATIONS

I. Text-Books

Names of Publications.	*Price.*	*Where available.*
i. S.S.L.C. Text-books 1932	Rs. as. p.	Mr. E. M. Gopalakrishna Kone, Esplanade, Madras.
English ...	1 4 0	Do.
Tamil Group A. ...	1 0 0	
Malayalam A. ...	1 0 0	
Kanarese A. ...	1 0 0	Do.
Sanskrit A. ...	1 0 0	
Intermediate Tamil Selections—1931 & 1932 ...	0 12 0 each	Do
B.A. Selections in Tamil—1932 & 1933 ...	1 0 0 each	
ii. Selections in Tamil, Telugu, Kanarese and Malayalam for the Intermediate Examination.	6 0 0 each	Registrar's Office
iii Selections in Tamil, Telugu and Kanarese for the B.A. Degree Examination in 2 Volumes each.	5 4 0 each	Do.
iv. Selections in Malayalam for the B. A. Degree Examination—		
Volume I—3 Parts. Volume II—3 Parts.	1 8 0 each part	Do.

II. Other Publications

	Rs a. p.	
i. Some South Indian Villages by Dr. Slater.	5 0 0 each.	The Oxford University Press, Madras.
ii. Sources of Vizianagar History by Dr. S. Krishnaswami Ayyangar.	4 8 0 each.	The Superintendent, Govt. Press, Mount Road, Madras.

Names of Publications.	Price. Rs.	A.	P.	Where available.
iii. Dravidic Studies—				
Volume I	0	2	0	The Superintendent, Govt. Press, Mount Road, Madras.
Volume II	0	8	0	Do.
Volume III	0	12	0	Do.
Bound Vols. I—III ...	2	4	0	Do.
iv. History of Sri Vaishnavas by Mr. R. Gopinatha Rao.	0	10	0	Do.
v. Psychological Tests of Mental abilities by Dr. A. S. Woodburne.	2	8	0	Do.
vi. The Nayaks of Madura by Mr. R Satyanatha Ayyar.	8	0	0	The Oxford University Press, Madras.
vii. A study of the Optical Properties of Potassium Vapour by Dr. A. L. Narayan.	1	12	0	Messrs. C. Coomaraswami Naidu & Sons, G. T., Madras.
viii. Absorption Spectra and their bearing on the structure of atoms and molecules by Dr. A. L. Narayan.	0	8	0	Do.
ix. Investigations on the molecular scattering of light by Dr. K. R. Ramanathan.	1	12	0	Do.
x. The Kavari, the Mukari and the Sangam Age, by Mr. T. G. Aravamudan	2	4	0	Do.
xi. Dravidic Studies–No. IV— On the Octaval System of Reckoning in India by Dr. Mark Collins.	0	12	0	Do.
xii. Stone Age in India by Mr. P. T. Srinivasa Ayyangar.	1	0	0	Do.
xiii. Anatomical and Taxonomic Studies of some Indian Fresh and Amphibious Gastropods by Mr. H. Srinivasa Rao, M.A., D.SC.	1	4	0	Do.

Names of Publications.	Price. Rs. A. P.	Where available.
xiv. India through the Ages by Dr. Sir Jadunath Sirkar, *Kt.*	1 8 0	Messrs. C. Coomaraswami Naidu & Sons, G. T., Madras.
xv. Political Theory of the Govt. of India by Mr. M. Ratnaswami.	1 0 0	Do.
xvi. Ante-natal, Natal, Neo-natal mortality of Infants—Dr. A. Lakshmanaswami Mudaliyar	2 0 0	Do.
xvii. History of Pallavas—Mr. R. Gopalan.	5 0 0	Do.
xviii. Industrial Welfare in India—Mr. P. S. Lokanathan.	4 0 0	Do.
xix. Critical Survey of the Malayalam Language and Literature by Mr. A. Krishna Pisharoti.	0 8 0	Do.
xx. Records of the Indian Museum Vol. xxxi—Part I—Mr. K. S. Padmanabha Ayyar.	1 0 0	Do.
xxi. "Restricted Relativity" by the Rev. D. Ferroli, S.J., D.SC.	4 0 0	Do.
xxii. Kuchelavirtham and Krishnavilasam — Mr. C. Achyuta Menon.	1 0 0	Do.
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xxv. Agastiya in the Tamil Land—Mr. K.N. Sivaraj Pillai.	1 0 0	Do.
xxvi. Purananutrin Palamai—Mr. K. N. Sivaraj Pillai.	0 12 0	Do.
xxvii. Rasa and Dhvani—Dr. A. Sankaran.	1 12 0	Do.

Names of Publications.	Price. Rs. A. P.	Where available.
xxviii. Sivadvaita Nirnaya—Mr. S. S. Suryanarayana Sastri.	2 8 0	Messrs. C. Coomaraswami Naidu & Sons, G.T., Madras.
xxix. Sivadvaita of Srikanta by Mr. S. S. Suryanarayana Sastri.	5 0 0	Do.
xxx. Taittiriya Pratisakhya by Pandit V. Venkatarama Sharma.	2 0 0	Do.
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xxxvi. Kavirajamarga—Edited by Mr. A. Venkata Rao.		Do.

Tamil Lexicon :—Copies can be had from Messrs. C. Coomaraswami Naidu & Sons, G. T., Madras, at the following rates :—

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NOTE :—Copies of Tamil Lexicon can be had at half the marked price by—

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